

Environmental Assessment

February 2002



Fire Management Plan

Florissant Fossil Beds

National Monument • CO

Environmental Assessment

Fire Management Plan

FLORISSANT FOSSIL BEDS NATIONAL MONUMENT • CO

Summary

This fire management plan environmental assessment evaluates actions at Florissant Fossil Beds National Monument that would treat fuel accumulations in the monument and at the wildland-urban interface as well as provide better defensible space in the event of a wildfire. This plan is also intended to protect and preserve the natural, paleontological, and cultural resources of the monument and to restore ecosystem processes. The monument is located 35 miles west of Colorado Springs in Teller County, Colorado and is surrounded by subdivisions and privately-owned ranches. The monument is administered by the National Park Service and includes 5,998 acres.

This project would reduce woody fuels, including dead standing and down timber, in two designated units: the Interface and Wildland Fire Management Units. Treatment in the Interface Fire Management Unit would reduce hazardous fuels in a corridor up to 330 feet wide along the perimeter of the monument boundary and 100 to 330 feet around developed areas. Treatments in this unit are designed to protect properties within and adjacent to the monument using a combination of mechanical thinning and prescribed burning. The Wildland Fire Management Unit would reduce fuels in the interior of the monument using prescribed burning to restore ecological processes. Over the next five years, approximately 579 acres in the monument are targeted for fuel reduction treatment. The treatment is needed to reduce fuel loads and the risk of a wildfire. In addition, decreased fuel loads would lessen the likelihood of a crown fire and would increase firefighters' ability to gain control of a wildfire.

The alternative of continue management/no action (Alternative A) and the preferred alternative (Alternative B) were evaluated in this environmental assessment. Under both alternatives, all wildland fires would be suppressed. The preferred alternative would reduce the volume of woody vegetation within the fire management units. Treatments associated with the preferred alternative would include the use of mechanized equipment to cut and chip vegetation and to remove selected trees. The debris would be scattered, or chipped and scattered. Larger slash material would be piled and burned on site. Prescribed burning would follow mechanical treatment in the Interface Fire Management Unit to further reduce hazardous fuels. Over the next five years, approximately 495 acres along the monument boundary and an additional 20 acres around developments would be treated in this unit. In the Wildland Fire Management Unit, prescribed burning would be conducted to reduce hazardous fuels, restore and maintain natural biotic systems, and reduce exotic vegetation with 64 acres targeted for treatment in the next five years. Before implementation of any prescribed burn, a burn plan would be developed and the public would be notified of all planned management activities.

Neither of the alternatives would have major environmental consequences. In the key area of fire control, the preferred alternative (Alternative B), which is also identified in this document as the environmentally preferred alternative, would be beneficial compared to the alternative of continue current management/no action.

Public Comment

Florissant Fossil Beds National Monument will be holding a public meeting in an open house format to provide the public opportunity to obtain information about the fire management plan and to submit comments. This meeting will occur on Thursday, February 21, 2002 from 6:00 - 8:00 pm at the Florissant Grange in Florissant, Colorado. If you wish to comment on the environmental assessment in writing, you may mail comments to the name and address below. This environmental assessment will be on public review for 30 days. Please note that names and addresses of people who comment become part of the public record. **If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

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United States Department of the Interior • National Park Service • Florissant Fossil Beds National Monument

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PURPOSE AND NEED

PURPOSE

The purpose of implementing a fire management plan at Florissant Fossil Beds National Monument is to protect human life and property, both public and private, within and adjacent to National Park Service (NPS) lands. The fire management plan is also intended to protect and preserve the natural and cultural resources of the monument for the enjoyment of present and future generations. This includes perpetuation of the ecosystem in which these resources occur. To help in achieving these long-term goals, the National Park Service has implemented a comprehensive fire management program. Actions within this program include, but are not limited to, fuels reduction, prescribed fire for resource benefit, and wildland fire suppression.

This environmental assessment addresses the proposed action to reduce fuel loads in Florissant Fossil Beds National Monument and at the interface of wildlands with adjacent developed areas. The northern, southern, and eastern boundaries of Florissant Fossil Beds National Monument are comprised of thick surface and aerial fuels, steep topography, and are subject to prevailing winds from the west and southwest. In addition to these factors that may lead to potentially extreme fire behavior, park boundaries are adjoined by numerous private properties that have houses located within 100 feet of the monument's boundary. The presence in and adjacent to the monument of contemporary and historic development, and paleontologic resources necessitates hazard fuel accumulations reduction inside the monument and along the boundary lines to prevent loss of life, damage to property, or harm to monument resources.

The purpose of this federal action is to provide a long-range fire management plan and program utilizing the benefits of fire to achieve desired natural resource conditions while protecting park resources and surrounding lands from fire. This action would create buffer zones with low fuels availability between the monument wildlands and development inside and outside of the monument. The reduced volumes of fuel in the monument would reduce the intensity of a fire that originated outside of the monument as the fire approached the boundary and could increase firefighters' ability to gain control of a wildfire. The use of prescribed fires would also re-establish fire as an ecological process that would help to restore and maintain natural biotic systems and reduce exotic vegetation.

NEED

During much of the 20th century, total fire suppression on public lands was viewed as the most appropriate method to prevent widespread, catastrophic wildland fires. However, as land managers gained knowledge and experience, it became obvious that complete exclusion of fire was not the best technique to promote ecosystem health. In fire-evolved systems, decades of suppression led to an accumulation of fuels that increased fire risk and had detrimental effects on native flora and fauna. In addition, accumulations of

combustible fuels near archeological sites and historic structures posed a high risk to cultural resources on public lands.

Following dangerous fire seasons in 1988 (which included the major Yellowstone National Park fires) and 1994, fire management policies for public lands were reviewed and updated. In 1995, the role of fire in the natural system was reaffirmed, and prescribed fire was re-introduced as a management tool. Reductions of fuel loads were planned to facilitate the control of wildfire resulting from human- or nature-induced ignitions.

Another severe fire season occurred in the year 2000, when nearly 7 million acres burned nationwide. This was more than twice the 10-year average. The numbers, sizes, and severities of the fires were the result of drought conditions, weather patterns, and large numbers of lightning strikes. In addition, nearly a century of fire suppression in areas that historically burned on a regular basis resulted in heavy fuels accumulations and altered vegetation structure. These conditions contributed to increased fire intensity, spread, and resistance to control.

In Florissant Fossil Beds National Monument, fire occurrence was inconsistently documented until 1995. A total of five fires have been reported since that time, all less than three acres in size. Fires that have occurred in the monument resulted from both lightning and human caused ignitions. Presently and in the future all wildland fires occurring in the monument will be suppressed. Florissant Fossil Beds National Monument needs this plan to guide management decisions in response to wildland fire incidents occurring within the monument and adjacent to the area's boundary. The size and configuration of the monument's land base eliminates the option of using wildland fire to obtain other resource objectives that may be possible in a park with a large aggregate acreage. In contrast the preferred alternative, in compliance with current federal policy (NPS 2001f), proposes to add a prescribed fire component that would enhance the monument's ability to manage and improve ecosystem components and processes while providing for firefighter and public safety.

Laws, Regulations, and Policies and the Planning Process

A contributing factor to the amount of damage resulting from wildland fires has been the growth of communities in areas adjacent to national parks and other public lands. Developments in these areas put human life, homes, and other property at risk. Fire management plans and fuel reduction activities in the wildland-urban interface are intended to reduce the risk of wildland fire in national parks and potential damage to properties in areas where wildlands adjoin developed areas.

Under the management policies for the National Park Service which include Director's Order -18 and the corresponding Reference Manual -18 (NPS 1998a), wildland prescribed fire management policy requires that all parks with vegetation capable of supporting fire must develop a fire management plan. A fire management plan implements the selected management actions from the park's Resources Management

Plan (2001e). Authority for carrying out a fire management program at Florissant Fossil Beds National Monument originates with the Organic Act of the National Park System, August 25, 1916.

The National Park Service is implementing fuels-management activities under the authorities and programs of the 2001 Interior Appropriations Act (H.R. 4578) and the President's Fire Initiative (known as the National Fire Plan).

- The 2001 U.S. Department of Interior appropriations bill provided funds to the National Park Service to "accelerate treatments, efforts, and collaborative projects with non-federal partners in the wildland urban interface."
- The National Fire Plan provides increased funding and direction to address wildland fire management needs that have been recognized as a result of the past decade of increasingly severe fire seasons.

In fiscal year 2002, the National Park Service will be undertaking numerous fuels-management projects at units throughout the country. Fuels management will be accomplished by such methods as mechanical thinning, prescribed fire and, to a lesser degree, herbicide treatments.

Prior to the implementation of specific fuels-management projects, the proposed actions and their alternatives must be evaluated in environmental assessments. These evaluations will be technically and legally defensible and in full compliance with the requirements of:

- The National Environmental Policy Act of 1969 (NEPA), as amended.
- The Council of Environmental Quality's (1978) "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," published in 40 *Code of Federal Regulations (CFR)* 1500-1508.
- *Director's Order #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision-Making* (NPS 2001a).
- Section 106 of the National Historic Preservation Act.
- The Advisory Council on Historic Preservation's Section 106 Regulations, "*Protection of Historic Properties*," (36 *CFR* 800).
- Director's Order #18, *Wildland Fire Management* (NPS 1998a).
- Director's Order #28, *Cultural Resource Management Guidelines* (NPS 1998b).

This environmental assessment was prepared in compliance with the National Environmental Policy Act of 1969 and its implementing regulations. The environmental assessment is being made available to the public for a 30-day review. Upon completion

of this review, the National Park Service will assess all public comments, and if necessary, modify the environmental assessment. A Finding of No Significant Impact (FONSI) would then be issued finalizing the decision, or, if the potential for significant impacts are identified, a Notice of Intent (NOI) would be publicized in the Federal Register for preparation of an Environmental Impact Statement (EIS).

This environmental assessment evaluates specific actions to treat fuel accumulations in the monument. It is also a programmatic environmental assessment in that it establishes a direction for overall fire management within the monument. Additional compliance may be necessary for site-specific actions where the potential for sensitive resources exist or is an area or of a nature that creates a public concern. The public would be notified of any such proposals prior to implementation.

Fire History at Florissant Fossil Beds National Monument

Fire management at Florissant Fossil Beds National Monument consists of full suppression of all wildland fires. Since the park's establishment in 1969, fire has been excluded from the monument. This has led to increased fuel loads and a change in species composition, common to many areas managed for complete fire exclusion.

Fire occurrence at the monument was not consistently documented prior to 1995. Since that time, five fires have occurred, all less than three acres in size. Prior to 1995, sporadic records indicate that fires resulted from both natural and human ignitions. The largest of these fires consumed 22 acres, and was human-caused (NPS 2001c).

Historically, the open ponderosa pine and grassland communities experienced fires of low severity at high frequencies. Fire return intervals ranged from five to 25 years. This reduced young woody species and maintained the open appearance of the landscape. This fire regimen also rejuvenated perennial grasses and forbs. Since the implementation of fire suppression, four to 20 return intervals have been eliminated from these communities. This has allowed pines to encroach on grassland, and increased hazardous fuels (NPS 2001c).

Closed ponderosa stands in the monument experienced a different natural fire regime. In these stands of greater density, fires were less frequent and of moderate severity. Return intervals ranged from eight to 178 years. Fires cleared debris and opened the crown spacing. Fire suppression has eliminated one to three return intervals, resulting in heavy fuels accumulation and increased tree density (NPS 2001c).

Fire history in the spruce-fir community of the monument has not been reported. In general, this association experiences fires of low frequency and high intensity. The closed nature of the canopy and presence of ladder fuels readily lead to quick moving, crown fires. This community has the highest potential for dangerous fire behavior (NPS 2001d).

Restoring fire's role as a dynamic force in shaping the vegetative structure would restore the conditions that occurred in the natural communities of Florissant Fossil Beds National

Monument. Restoring natural processes is a goal of the Resource Management Plan for the monument (NPS 2001e) which states that management should “maintain or restore, where possible, the primary natural resources of the monument and those ecological conditions that would prevail were it not for the advent of modern civilization.” The monument’s Statement for Management (NPS 2000) further directs management to “manage the monument’s wildlife and botanic communities to enable the re-establishment of naturally functioning ecosystems.”

Restoration of natural resources and processes and reducing fuel loads for the protection of human health and safety as well as sensitive resources can be accomplished by implementing appropriate strategies. The process for selecting the best approach must integrate public input, interagency cooperation, and fire management expertise. The selection process presented in this environmental assessment is based on professional expertise and sound scientific information, and is consistent with National Park Service authority and management practices.

DESCRIPTION OF THE MONUMENT AND GEOGRAPHIC LOCATION

Florissant Fossil Beds National Monument is located just south of the town of Florissant, approximately 30 miles west of Colorado Springs, Colorado via U.S. Highway 24. The monument’s fossil beds, remnants of ancient Lake Florissant, are internationally renowned for the variety and number of fossils from the late Eocene Epoch. Particularly notable are the fossilized insects and plants this area has yielded since its discovery by scientists in the late 1800s. Petrified stumps of giant sequoias are the most visible remnants of the ancient ecosystem but a wealth of fossil insects, seeds, and leaves are preserved here in remarkable detail.

The 5,988 acre national monument has more than 14 miles of hiking trails, a museum/visitor center, a picnic area, and numerous opportunities for wildlife observation. The 1878 Hornbek Homestead recalls the life of the early Colorado pioneers.

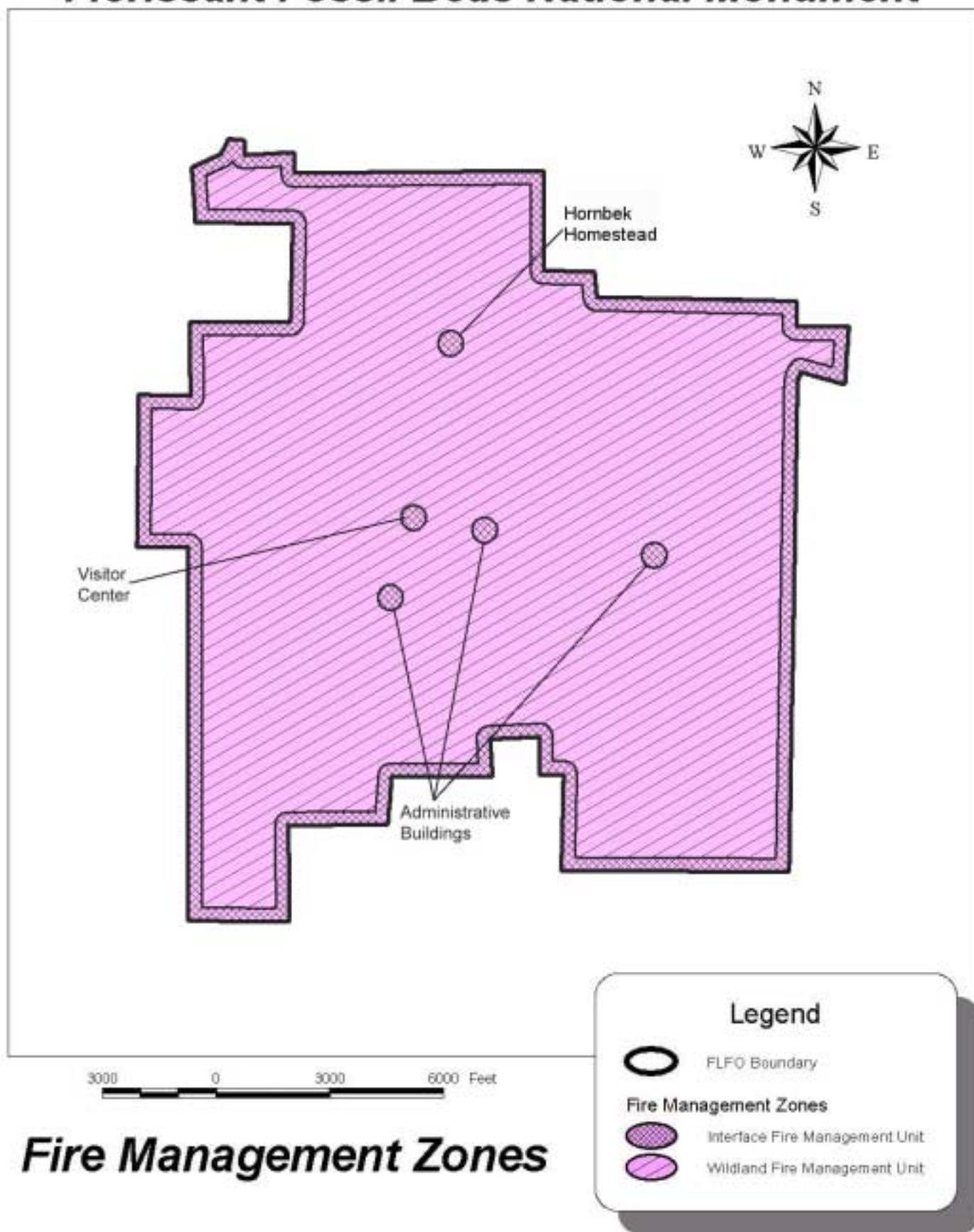
DESCRIPTION OF THE PROJECT AREAS

The monument lies within the eastern slope of the Rocky Mountains at an elevation of about 8,200 feet to 8,900 feet in the Montane Life Zone. The monument is characterized by mountain meadows interspersed with open forests of ponderosa pine. Dense forest stands of Douglas fir and blue spruce can also be found on north facing slopes. Aspen trees are restricted to moist drainages throughout the area. Meadows occupy most of the area that falls within the boundaries of the ancient Florissant lakebed. The basin is visually dominated by 14,110 foot Pikes Peak, approximately 13 miles southeast of the monument.

As shown in the fire management plan project area map, the monument is divided into two fire management units:

- The Interface Management Unit comprises a 330-foot strip along the monument boundary and a 100 to 300-foot wide strip surrounding cultural, paleontological and administrative sites. This interface unit is to be treated and managed as a wildland-urban interface with general fuels reduction. Activities in the Interface Management Unit include thinning and limbing, wildland fire suppression, and prescribed fire. Vegetative communities in the interface unit include montane meadows, ponderosa pine stands, and dense spruce-fir stands. The majority of this area is accessible by paved, gravel or dirt roads, with no more than a one-half mile walk required to access most portions.
- The Wildland Fire Management Unit consists of all monument lands not included in the interface unit. This second unit would be managed to protect public health and safety, safeguard valuable monument resources, and restore vital ecosystem functions. Actions planned for this management unit include suppression of wildland fire and prescribed fire. The vegetative communities here are also montane meadow, ponderosa pine and dense spruce-fir stands. Most of this unit is also accessible by paved, gravel and dirt roads with no more than a half-mile walk to reach most portions.

Florissant Fossil Beds National Monument



P:\Stephen - Dec. 2001

SUMMARY OF ENABLING LEGISLATION DEFINING WHY THE MONUMENT WAS ESTABLISHED

Florissant Fossil Beds National Monument was established by an Act of Congress on August 25, 1969 to “preserve and interpret for the benefit and enjoyment of present and future generations the excellently preserved insect and leaf fossils and related geologic sites at the Florissant Lakebeds” in Teller County, Colorado. These geologic processes preserved an ecosystem of the late Eocene Epoch (34 – 35 million years ago), providing collections of some of the most diverse and complete assemblages of plants and insects from North America.

Florissant Fossil Beds also was set aside as part of the National Park system to manage the monument in accordance with the 1916 Organic Act; that is, “...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” Additionally, establishment of the monument encouraged controlled scientific exploration and research to advance human knowledge of fossils and other geologic resources.

PROJECT’S RELATIONSHIP TO OTHER PLANS

National Park Service management policies provide clear direction to park service staff to protect human life as an overriding principle. Fire may also be used to protect, maintain and enhance resources and restore natural ecological function. Fire management planning must provide for firefighter and public safety, protect important resource values, be consistent with resource management objectives and comply with environmental laws and regulations. This fire management plan would be consistent with the monument’s general management plan (NPS 1985b) and the resource management plan (NPS 2001e). These documents provide the broad guidance within which the proposed action would function.

Fire once played an important role in the functioning of the local ecosystem. Many plant and wildlife species have evolved under the influence of fire and, in some cases, depend on fire for their continued existence. In many cases, the landscapes we see today are the legacy of both past fires and fire suppression. Removing fire from an ecosystem deprives that system of a powerful and dynamic natural force. It is the policy of the National Park Service to allow natural processes to occur to the extent practical while meeting park unit management objectives. The ultimate goal of fire management is to restore fire to the monument, where possible, through the use of prescribed fire.

- General management plan broadly addresses management of wildland fire at Florissant Fossil Beds National Monument. This document maintains that the National Park Service will “manage the monument’s wildlife and botanic communities to enable the re-establishment of naturally functioning ecosystems.”

- The resource management plan states that the basic resource management goal for Florissant Fossil Beds National Monument is to “maintain or restore, where possible, the primary natural resources of the monument and those ecological conditions that would prevail were it not for the advent of modern civilization.” Fire management is generally addressed in the Natural Resource Component of the Resource Management Plan in Project FLFO-N-060.

Implementation of the Fire Management Plan would support Florissant Fossil Beds National Monument’s General Management Plan and Resource Management Plan by re-establishing fire as an ecological process that would help restore and maintain natural biotic systems.

In support of restoration efforts, two new resource management programs have begun in the monument. The exotic plan management program seeks to control at least seven invasive species – including the noxious weeds Canada thistle, field bindweed, musk thistle, and yellow toadflax – in the monument. The disturbed lands restoration program seeks to restore the natural form and function of areas disturbed by past land use practices. Through this program, five of the monument’s 44 earthen dams were removed in 2001, and the contours, hydrology, and vegetation at the sites restored. The proposed action is consistent with the intent of these programs to restore natural ecosystem functions within the monument.

Florissant Fossil Beds National Monument is entirely surrounded by private property. Development adjacent to monument lands has increased the necessity for a sound, science based, fire management plan. Although the specific fuel management and fire prevention/suppression plans of all adjacent landowners are not known, the actions proposed in the fire management plan would increase fire protection and public health and safety. Monument staff have joined with other fire management organizations in the Pikes Peak region to educate the public about the role of fire and fuels reduction in wildland management.

To ensure cooperation and conformance with area fire management policies, working relationships and reciprocal agreements with the following entities are in place through a multi-agency Annual Operating Plan:

- Pike National Forest has an active, ongoing fire management program, including use of prescribed fire;
- Florissant Volunteer Fire Department responds to all fires within the monument. Monument staff provide mutual aid to the department one mile outside the boundary;
- Sanborn’s Western Camp and The Nature Place, which abuts Florissant Fossil Beds National Monument to the west provides a variety of recreational and educational experiences for children, adults, and organizations. These landowners have expressed interest in managing wildfire and prescribed fire for mutual benefit;

- 4-Mile Volunteer Fire Department supplements the Florissant Volunteer Fire Department with additional response capabilities;
- Colorado State Forest Service provides fire management expertise to both private and public entities and coordinates the multi-agency agreement.

IMPACT TOPICS

Impact topics were used to focus the evaluation of the potential consequences of the proposed actions and alternatives. Impact topics were identified based on legislative requirements, topics specified in *Director's Order #12 and Handbook* (NPS 2001a), and park-specific resource information. Impact topics for fuels management at Florissant Fossil Beds National Monument are presented in Table 1. In cases where an impact topic could be dismissed, the rationale for this action is included in the table.

Table 1: Impact Topics for the Florissant Fossil Beds National Monument Fire Management Plan Environmental Assessment

Impact Topic	Retain or Dismiss ^{a/}	Relevant Regulations or Policies
Biological and physical resources		
Air quality	Retain	Federal Clean Air Act (CAA), CAA Amendments of 1990 (CAAA), NPS <i>Management Policies 2001</i> , and Utah Administrative Code, Title 307
Ecologically critical areas or other unique natural resources	Dismiss	Wild and Scenic Rivers Act, 36 CFR 62 criteria for national natural landmarks, NPS <i>Management Policies</i>
Endangered or threatened species and their habitats	Retain	Endangered Species Act; NPS <i>Management Policies</i>
Prime and unique agricultural lands	Dismiss	Council on Environmental Quality 1980 memorandum on prime and unique farmlands
Soils	Retain	NPS <i>Management Policies</i>
Vegetation	Retain	NPS <i>Management Policies</i>
Water quality and hydrology	Retain	Clean Water Act, Executive Order 12088, NPS <i>Management Policies</i>
Wetlands and floodplains	Retain	Executive Order 11988, Executive Order 11990, Rivers and Harbors Act, Clean Water Act, NPS <i>Management Policies 2001</i>
Wilderness	Dismiss	Director's Order 41; NPS <i>Management Policies 2001</i>
Wildlife	Retain	NPS <i>Management Policies</i>
Cultural resources	Retain	Section 106; National Historic Preservation Act; 36 CFR 800; National Environmental Policy Act; Executive Order 13007; Director's Order 28; NPS <i>Management Policies</i>
Paleontological Resources	Retain	NPS <i>Management Policies</i>
Socioeconomic considerations		
Conflicts with land use plans, policies, or controls	Dismiss	NPS <i>Management Policies</i>
Economics	Retain	40 CFR 1500 Regulations for Implementing NEPA
Energy requirements and conservation potential	Dismiss	NPS <i>Management Policies</i>
Environmental justice	Dismiss	Executive Order 12898
Indian trust resources	Dismiss	Department of the Interior Secretarial Order No. 3206, Secretarial Order No. 3175
Natural or depletable resource requirements and conservation potential	Dismiss	NPS <i>Management Policies</i>
Monument operations	Retain	NPS <i>Management Policies</i>
Public health and safety	Retain	NPS <i>Management Policies</i>
Sustainability and long-term management	Dismiss	National Environmental Policy Act, 40 CFR 1500 Regulations for Implementing NEPA, NPS <i>Management Policies</i>

Impact Topic	Retain or Dismiss ^{a/}	Relevant Regulations or Policies
Visitor use and experience	Retain	Organic Act; NPS <i>Management Policies</i>

a/ Rationale for dismissal:

Ecologically critical areas: The Council on Environmental Quality regulations (40 CFR 1508.27(b)(3)) require consideration of the severity of impact (intensity) on unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. No ecologically critical areas have been identified within or adjacent to Florissant Fossil Beds National Monument, and this impact topic has been dismissed from discussion. However, the fossil resources found in the monument do form a unique natural area, and will be discussed in this environmental assessment under "Paleontology."

Prime and unique agricultural lands: Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that the land is available for farming uses. Lands within Florissant Fossil Beds National Monument are not available for farming and, therefore, do not meet the definitions.

Wilderness: According to *Management Policies* (NPS 2001), proposals having the potential to impact wilderness resources must be evaluated in accordance with National Park Service procedures for implementing the National Environmental Policy Act. Because Florissant Fossil Beds National Monument does not have any designated wilderness areas, this impact topic is dismissed.

Conflicts with land use plans, policies, or controls: Refer to the section "Project's Relationship to Other Plans" for a discussion of the absence of conflicts with other plans.

Energy requirements and conservation potential: Refer to the impact topic "Sustainability and long-term management" for a rationale for dismissal.

Environmental justice: Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires that all federal agencies address the effects of policies on minorities and low-income populations and communities. None of the alternatives would have disproportionate health or environmental effects on minorities or low-income populations as defined in the Environmental Protection Agency's Draft Environmental Justice Guidance (July 1996).

Indian trust resources: Indian trust assets are owned by Native Americans but held in trust by the United States. Requirements are included in the Secretary of the Interior's Secretarial Order No. 3206, "American Indian Tribal Rites, Federal – Tribal Trust Responsibilities, and the Endangered Species Act," and Secretarial Order No. 3175, "Departmental Responsibilities for Indian Trust Resources." The Bureau of Indian Affairs (BIA) and the National Park Service have formed a joint agency, the National Interagency Fire Center (website, <http://www.fire.nps.gov/bia>), to handle wildfire management on Indian trust lands based on fire management plans approved by the Indian landowner. According to NPS personnel, Indian trust assets do not occur within Florissant Fossil Beds National Monument.

Natural or depletable resource requirements and conservation potential: Refer to the impact topic "Sustainability and long-term management" for the rationale for dismissal.

Sustainability and long-term management: Sustainability is the result achieved by doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the short- and long-term environmental impacts of development and other activities through resource conservation, recycling, waste minimization, and the use of energy-efficient and ecologically responsible materials and techniques.

Project actions would not compete with, dominant monument features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity associated with wetlands.

The NPS *Guiding Principles of Sustainable Design* (1993) directs NPS management philosophy. It provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used in the design and management of visitor facilities that emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. Sustainability principles have

been developed and are followed for interpretation, natural resources, cultural resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operations. The National Park Service also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology. Energy efficiency is incorporated into the decision-making process during the design and acquisition of buildings, facilities, and transportation systems that emphasize the use of renewable energy sources.

OBJECTIVES

One of the risks of managing wild lands is wildfire. Unnatural buildup of highly volatile fuel can ignite easily and readily transmit fire across the landscape. Practices that mimic or replace natural fuels reduction can reduce the risk posed by wildfire to persons, property, and other resources.

Park managers must develop strategies to limit the risk of fire migrating across park boundaries. Fire management, including judicious use of prescribed fire and thinning of vegetation, is intended to prevent the ignition and spread of wildfire and to restore and maintain the integrity of diverse ecological systems.

A variety of management techniques are available for use on National Park Service lands. Methods used in the Florissant Fossil Beds National Monument fire management plan are designed to meet the objectives shown in Table 3, with protection of human health and safety being the highest priority. Table 3 also summarizes how well each alternative meets the project objectives, based on the information presented in the “Affected Environment and Environmental Consequences” section.

Fuel loads can be reduced by implementing appropriate strategies. The process for selecting the best approach must integrate public input, interagency cooperation, and fire management expertise. The selection process presented in this environmental assessment is based on professional expertise and sound scientific information, and is consistent with National Park Service authority and management practices.

SCOPING

National Park Service internal discussions identified most of the main issues to be addressed in this environmental assessment. Protection of public health and safety, preservation of vital park resources, and reducing wildfire risk to adjacent private property are the primary objectives of the fire management plan. Other impact topics identified for assessment included air quality, endangered or threatened species, soils, vegetation, water quality, wetlands and floodplains, wildlife, cultural resources, paleontological resources, economics, monument operations, and visitor use and experience.

The U.S. Fish and Wildlife Service was contacted regarding potential effects to endangered or threatened species and designated critical habitat for this project. Through consultation it was determined that there are no listed threatened, endangered, or rare species, species of concern, or designated critical habitat within the treatment areas for

the proposed action (Pete Plage, USFWS, pers. comm.). See the “Endangered or Threatened Species” section for the detailed evaluation of this impact topic.

The monument initiated Section 106 consultation with the Colorado State Historic Preservation Officer on December 13, 2001. Upon completion, this environmental assessment will be sent to the Colorado State Historic Preservation Office for review and comment in partial completion of Section 106 compliance for implementation of the fire management plan and the wildland-urban interface projects at Florissant Fossil Beds National Monument.

Consultation letters were sent to concerned American Indian tribe(s) (see list of recipients in the “Consultation/Coordination” section) on January 6, 2002. The letter sent to the American Indian tribe(s) is appended to this document (Appendix A). To date, no response has been received.

Florissant Fossil Beds National Monument issued a notice of public scoping on June 18, 2001 to seek public comments related to the proposed action. The park received a total of 5 comments during the 30-day comment period. Two commentors were in support of hazardous fuels reduction to prevent wildfire. Another individual offered suggestions for thinning activities such as chipping and limbing as well as proposing the monument use volunteers or contract professionals to perform the actions. The commentor also suggested that prescribed burning activities take place in the winter and to provide the public with ample notice. The environmental assessment addresses these issues and concerns and how they could be resolved.

One individual opposed prescribed burning except in a limited area in the monument and proposed the use of grazing as a means of fuels reduction. Grazing as a means to remove fuels in the monument is not considered to be an appropriate use based on criteria established in National Park Service Management Policies (NPS 2001f, sections 8.2 and 8.6). Furthermore, grazing would not be an effective tool in reducing woody fuels in the monument particularly at the boundary and therefore would not meet the monument’s objective to protect human life, property and resources. Historically, fire has been a critical, natural influence on vegetative species composition, diversity, and stability of the monument’s forest ecosystem. Management policies that included fire suppression have altered the frequency and intensity of fires, as well as the forest composition and structure in the monument. Using grazing as a fuels management tool would not support the monument’s objective of restoring and maintaining natural resources and processes in the monument. Therefore, grazing has not been evaluated further as a means of fire management in the monument.

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ALTERNATIVES CONSIDERED

Two alternatives described in this section were evaluated. They include the alternative of continue current management/no action and the preferred alternative. Fuel reduction treatments associated with the preferred alternative include mechanical thinning using specialized equipment and prescribed fire. The actions identified in the preferred alternative are designed to meet the fire management plan objective of risk reduction using methods that mimic natural fire processes and effects. The alternatives are summarized in Table 2 and described below.

Table 2: Alternative Descriptions

Alternative	Descriptions/Treatment	Acres to be Treated Over Next 5 years
A	Continue current management/no action.	0
B – includes:	Preferred action	
Interface Fire Management Unit		
Boundary		
Zone I	Hand-clearing, debris scattered, chipped and scattered, slash piled on site and burned, or thinned trees dragged and hauled off-site. Prescribed fire following mechanical treatment.	195
Zone II	Hand-clearing, debris scattered, chipped and scattered, slash piled on site and burned, or thinned trees dragged and hauled off-site. Prescribed fire following mechanical treatment.	300
Developments	Hand-clearing, debris scattered, chipped and scattered, slash piled on site and burned, or thinned trees dragged and hauled off-site. Prescribed fire following mechanical treatment.	20
Wildland Fire Management Unit		
Ecosystem Restoration	Prescribed fire.	64

ALTERNATIVE A: CONTINUE CURRENT MANAGEMENT/NO ACTION

Continue current management/no action is the baseline condition against which proposed activities are compared. It is defined as continuing existing management practices into the future. All wildland fires would be immediately suppressed to limit fire spread. Rapid assignment of firefighters with hand tools and/or in some situations, mechanized equipment would be utilized to extinguish all fires. Hazard fuel reduction and prescribed fire to achieve resource objectives would not be implemented under this alternative.

The existing program does not address fuel buildup. At some future time, an ignition from a natural or human-caused source could result in a wildland fire. Under most conditions, surface fires that would consume surface plant cover and portions of the understory and midstory would be expected. However, under drought conditions and/or high wind speeds, a running crownfire that would destroy the overstory could result.

Under the current program, no fuels reduction would take place inside the monument and along the boundary of the park. Therefore, a fire inside the monument would burn with the same intensity as surrounding lands. The no action alternative would not offer any advantages in the ability to control wildfires compared to the preferred alternative.

Management of wildland fire activities at Florissant Fossil Beds National Monument must include all appropriate mitigation and best management practices as outlined in NPS Management Guidelines 2001, and are to be conducted in a manner that minimizes impacts to natural and cultural resources. During wildland fire suppression activities, protection of cultural and ethnographic resources would include some or all of the following strategies:

Natural Resources

- Water bars would be used to prevent erosion of disturbed soils,
- Fire lines would be kept to a minimum width necessary to allow backfiring or creation of a safe backline,
- Whenever possible, natural barriers would be used to avoid unnecessary fire line construction,
- If adequate water and pumps were available, wet lines would be used in lieu of hand line construction, and
- Rehabilitate all fire lines, camps, and other disturbances.

Cultural Resources

- Use protective tactics in areas identified by the Natural or Cultural Resource Management specialist as having cultural significance, either archeological, historical, landscape, or ethnographic;
- Locate and isolate sites that are vulnerable to fire or to human activities associated with the burns, and flag known sites for avoidance;
- Exercise caution during aerial dumping of water or fire retardant to ensure sites and structures are not impacted;
- At sites vulnerable to fire, remove heavy fuels that cause long-duration heating;
- Educate fire treatment personnel about cultural resources in general and the need to protect any cultural resources encountered. This would include instructions for notifying appropriate personnel if human remains were discovered;
- Minimize ground disturbance when possible;
- Fire control lines would not be permitted through cultural sites;
- Wrap important cultural structures, including culturally altered trees, with fire shelters;
- Conduct post-fire cultural resources surveys to identify and evaluate newly discovered sites and/or document damage to known sites; and
- Develop a plan to ensure stabilization or information retrieval from cultural resources in burned areas.

Paleontological Resources

- Use protective tactics in areas identified by the Natural Resource Management specialist as having vulnerable paleontological resources;
- Locate and isolate sites that are vulnerable to fire or to human activities associated with suppression activities, and flag known sites for avoidance or treatment;
- At paleontological sites vulnerable to fire or fire suppression activities, remove heavy fuels that cause long-duration heating;

- Educate fire treatment personnel about known paleontological locations, and the need to protect fossils encountered during fire suppression activities;
- Minimize ground disturbance, including construction of helispots, when possible;
- Fire control lines would not be permitted through areas with paleontological resources;
- Conduct post-fire resource surveys to identify and evaluate newly discovered fossils and/or document damage to known fossil sites;
- Develop a plan to ensure stabilization or information retrieval from paleontological sites in burned areas; and
- During rehabilitation of fire control lines or burned areas, exercise care to avoid damage to paleontological resources.

ALTERNATIVE B: PREFERRED ALTERNATIVE

The preferred alternative would provide defensible fire suppression areas by reducing fuel loads in targeted areas along the monument boundary and around developments and important cultural, natural and paleontological resources. The re-establishment of fire within the monument would facilitate the restoration of native fire-adapted plant communities and reduce exotic vegetation to maintain a desired ecological condition.

Under the preferred alternative, two fire management units would be delineated within the monument, the Interface Fire Management Unit and the Wildland Fire Management Unit (see Figure 1). The preferred alternative would implement a combined program of wildland fire suppression, mechanical thinning of vegetation and/or prescribed fire in each unit. Management activities would occur in the monument between April through November, weather permitting.

Paleontological and cultural resources within both units would be identified and protected from both mechanical and prescribed fire treatments. Mechanical thinning at these sites would be conducted using hand tools and chainsaws only if the treatment itself would not have an adverse effect on the resource. These sites would be protected from fire treatments through appropriate hand-line or wet-line construction.

Under this alternative, all wildland fires would be suppressed using an appropriate management response. Management responses to specific wildland fires would be determined through evaluation of public and firefighter safety, fire behavior, values at risk, potential suppression damage and availability of fire management resources. Management responses will vary from fire to fire and

sometimes even along the perimeter of a fire. Appropriate management response options range from monitoring without on-the-ground disturbance to intense suppression actions on all perimeters of the fire. Wildfires would be suppressed using hand tools and/or mechanical equipment immediately to prevent fire spread.

Fire Management Units

Interface Fire Management Unit

The Interface Fire Management Unit lies adjacent to the monument boundary and its neighboring urban interface areas. It also encompasses several administrative, paleontological, and archeological sites within the monument. As the monument is completely surrounded by private lands, this fire management unit would encompass a buffer that is up to 330 feet wide around the monument perimeter and developments within the monument that could be adversely affected by wildland fire.

Much of this fire management unit is accessible by paved, gravel or dirt roads (no more than 0.5 mile hike required to access most portions). Major roads are Teller County Highway 1, Upper Twin Rock Road and Lower Twin Rock Road. These roads provide access to additional private roads and driveways of landowners with property adjacent to monument lands. Portions of developed trails are also present within the fire management unit: Walk Through Time, Petrified Forest Loop, Hornbek Wildlife Loop, Sawmill, Shootin' Star, and Twin Rock Trails.

The vast majority of this unit is a combination of montane meadows interspersed with open ponderosa pine stands on the southern exposures grading into more dense spruce-fir stands on the northern slopes.

Aggressive mechanical hazard fuel reduction would occur along the boundary in close proximity to developed areas, and cultural, natural and geologic resources that are at risk from a high intensity fire. The intent of this program is to reduce the wildland fire hazard to levels that enable fire suppression forces to safely control fires with minimal loss of values and to reduce fuel loads around structures and important resources thereby reducing the potential for wildland fires in the future. Two treatment areas are defined for the Interface Fire Management Unit: the boundary of the monument which encompasses two treatment zones (Zone I and Zone II), and the area surrounding developments.

Boundary: The treatment area along the boundary would be divided into two zones. The most aggressive treatment would take place from the fence boundary and extend from 30 to 130 feet into the monument (Zone I). The less aggressive treatment would begin where this treatment ends and continue another 70 to 200 feet into the monument (Zone II). The width of, and treatment objectives for, each

zone would be designed for maximum protection of the values at risk and would be dependent upon slope, aspect, and fuel type. Over the next five years, an estimated 525 acres would be treated; 225 in Zone I and 300 in Zone II. Details of the monument's five-year fuels management plan are provided in Appendix B. Proposed mechanical treatments and objectives for each zone are as follows:

Zone I:

1. Establish canopy spacing ranging 3 to 20 feet between overstory trees and pole sized-trees. All stumps would be flush-cut at ground level.
2. Limb all overstory trees up to 5 feet above ground level. Limbs should be removed as close to the trunk as possible without damaging the tree.
3. Eliminate (greater than 90 percent) all dead-and-down material greater than two inches diameter.
4. Fall and remove all snags, following consultation with resource management specialists.

Zone II:

1. Establish a canopy opening ranging from 1 to 10 feet between overstory and pole-sized trees. All stumps would be flush-cut at ground level.
2. Limb 30 percent to 80 percent of all overstory trees up to five feet above ground level. Limbs should be removed as close to the trunk as possible without damaging the tree.
3. Reduce (50 percent) dead-and-down greater than 2 inches diameter.

For aesthetic purposes, Zone II may have groupings of trees as long as the overall canopy opening is maintained. In addition, wildlife snags would be left standing in Zone II as long as there are no safety concerns from personnel working under or in the vicinity of hazardous snags.

Thinning of woody vegetation in both zones would entail the use of hand tools and chainsaws. The removal of mechanically thinned vegetation along the monument boundary would vary according to the amount of woody material collected. When a limited amount of small sized material is collected, the material would be either hauled into the monument beyond the Interface Unit boundary and scattered in a manner that would not be easily visible, or the material would be chipped and scattered in place. Larger amounts of slash material would be stacked into piles and burned in open areas. Heavier woody debris would be stacked into piles and burned when removal would cause negative impact on forest resources. In areas with access to removal routes, this debris would be

removed from the treatment area and used for monument projects, put up for bid as firewood, or used as a goods for services payment for treatment activity. Mechanical thinning activities would be done using park personnel or private contractors and would be conducted throughout the year when weather permitted.

Following mechanical treatment, prescribed fire may be used to further reduce hazard fuel accumulation within both zones of the Interface Fire Management Unit. The following are prescribed fire objectives established for the fire management plan:

Open Canopy Ponderosa Pine:

1. Reduce total fuel load, including all woody material, litter, and duff, by 40 to 80 percent, immediate post-burn
2. Limit overstory ponderosa pine mortality to 5 percent within 5 years post-burn
3. Generate 20 to 70 percent mortality in pole-sized trees within 5 years post-burn
4. Increase diversity, percent cover, and/or density of native grass and native forb species by at least 15 percent within 5 years post-burn; reduce the percent cover of any non-native plant species by at least 15 percent within 5 years post-burn

Closed Canopy Ponderosa Pine:

1. Reduce total fuel load, including all woody material, litter, and duff, by 40 to 80 percent, immediate post-burn
2. Limit overstory ponderosa pine mortality to 5 percent within 5 years post-burn
3. Generate 5 to 35 percent mortality in pole-sized trees within 5 years post-fire
4. Increase diversity, percent cover, and/or density of native grass and native forb species by at least 15 percent within 5 years post-burn; reduce the percent cover of any non-native plant species by at least 15 percent within 5 years post-burn

Mixed Conifer Stands with Ponderosa Pine Component:

1. Reduce total fuel load, including all woody material, litter, and duff, by 40 to 80 percent, immediate post-burn

2. Generate sufficient crown scorch, foliage consumption, or cambium heating to reduce overstory density 10 to 25 percent and/or produce mortality in 10 to 25 percent of overstory trees within 5 years post-burn
3. Generate sufficient crown scorch, foliage consumption, or cambium heating to reduce pole-sized tree density 10 to 25 percent and/or produce mortality in 10 to 25 percent of pole-sized trees within 5 years post-burn
4. Increase aspen (*Populus tremuloides*) seedling/sucker density by at least 20 percent within 5 years post-burn

Prescribed burning would only be used within Zone I if logistical constraints (road access, fuel breaks, etc.) make it a safer, more efficient option than attempting to burn up to the border between Zone I and II. Prescribed burning would occur from spring through fall under specified conditions and would be implemented using best management practices to ensure protection of property and lives by reducing the potential for escaped fire. Prescribed fire must meet predetermined resource goals, prescription parameters and management constraints before being implemented. Before implementation of any prescribed fire within this unit, a burn plan would be developed that would define the strategic purpose, goals, and objectives for the project, and identify burn prescription conditions under which the project must be implemented. Planning and execution of prescribed fire would be accomplished by qualified personnel, as determined by National Wildfire Coordination Group standards and would follow the guidelines stated in Director's Order 18 (NPS 1998a).

Within the Interface Fire Management Unit, prescribed fire would utilize the natural features (slope, aspect, and vegetation), natural fuel breaks and existing roads and trails to perimeter control. Construction of perimeter fire control lines would be evaluated in terms of the impacts to natural and cultural resources and cost and defensibility prior to use. The monument would develop a short and long term monitoring program to measure attainment of prescribed fire objectives.

Developments: Within the Interface Fire Management Unit, fuels would be reduced in an area from 100-330 feet around developments within the monument that could be adversely affected by wildland fire. These include the visitor center, Hornbek Homestead, and all other administrative buildings. Total area to be treated over the next five years would be an estimated 20 acres. The mechanical treatments and objectives for these areas are the same as those described for Zone II above. Removal of woody debris would be similar to that discussed above for the boundary area. Following mechanical fuel reduction, prescribed fire would be used to further reduce fuel accumulations.

Management at the boundary of the monument would be designed to emphasize reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire

management entities. Additionally, strong interagency fire and emergency services agency participation would be encouraged within this management unit. Interaction with adjacent landowners through Florissant Fossil Beds National Monument participation in prevention programs and mutual hazard fuels reduction projects would be encouraged.

Wildland Fire Management Unit

The Wildland Fire Management Unit encompasses all lands not included in the interface unit; essentially all areas within the monument removed from the boundary and developments. Most of this fire management unit is also accessible by paved, gravel or dirt roads (no more than 0.5 mile hike required to access most portions). Major roads are Teller County Highway 1, Upper Twin Rock Road and Lower Twin Rock Road. Portions of developed trails are present within this fire management unit: Petrified Forest Loop, Hornbek Wildlife Loop, Boulder Creek, Sawmill, Hans Loop, Shootin' Star, and Twin Rock Trails.

The physical description of this unit is the same as for the interface unit. The vast majority of this unit is a combination of montane meadows interspersed with open ponderosa pine stands on the southern exposures grading into more dense spruce-fir stands on the northern slopes.

Prescribed fire in this treatment unit would be used to reduce fuel accumulation and reduce the potential for a wildfire originating within the monument and migrating across the boundary. As stated above under the Interface Fire Management Unit, before implementation of any prescribed fire within this unit, a burn plan would be developed that would specify the areas to be treated and their corresponding size along with criteria used to select the areas. Implementation of prescribed fires would be the same as that described above for the Interface Fire Management Unit.

Restoration of ecological processes, as identified in the monument's 2001 Resource Management Plan, is primarily targeted to interior areas where fuel build-up has increased over the years and in areas where the landscape has been altered by human intervention. Under this alternative, prescribed fire would also be used in this management unit to ensure natural processes and native vegetation are restored in the monument as well as to contain the spread of exotic plants.

The vegetative communities at Florissant Fossil Beds National Monument have been altered by agricultural land use and fire suppression since the mid-19th century. The combination of grazing and fire suppression has led to a decrease in native grass and herbaceous cover and an increase in coniferous trees. As pine and fir woodlands age, grass and herbaceous surface vegetation decline due to encroachment of these coniferous species.

The scope of the prescribed fire program would focus on sites with unnaturally high fuel loads and restorable sites that have the potential to support the desired plant community. The prescribed fire program would focus on reducing the density of post-settlement trees in both meadows and pine and pine-fir forest within this unit. Fire would be limited from stands of trees greater than 140 years of age. This plan would result in the successful maintenance of both the montane meadows and a more open character to the ponderosa pine dominated forests within the monument. The vegetative communities would move toward pre-settlement conditions and overall forest health would be improved. Proposed prescribed fire treatment objectives for each major vegetative community are the same as those discussed above in the Interface Fire Management Unit.

Best management practices and mitigation measures would be used to prevent or minimize potential adverse effects associated with this fire management plan. These practices and measures would be incorporated into the fuels management actions to ensure that major adverse effects would not occur. Mitigation measures for the protection of specific resources are discussed below in "Mitigation Included and Analyzed as Part of Alternative B." Examples of best management practices and mitigation measures would include:

Natural Resources

- Smoke management reporting procedures for burning in Colorado will be followed for all prescribed fire operations.
- Employ "Minimum Impact Suppression Tactics" when possible.
- Parking vehicles in specified areas and having crews walk to the project sites to avoid resource damage.
- No off road vehicle use unless approved by the Superintendent.
- No heavy equipment use unless approved by the Superintendent.
- The Superintendent must approve chainsaw and pump use.
- Using refueling stations with ground protection for refueling chainsaws to minimize chances of gasoline spills.
- The Superintendent must approve retardant and low-level aircraft use.
- Slash will not be moved from upland sites into a wetland.
- Slash will be kept out of open water.

- Whenever practical, equipment maintenance and fueling will not take place in wetlands.
- Limbing and trimming activities associated with the Interface Fire Management Unit could potentially affect tree-nesting birds and care would be taken to avoid nests.
- Both the thinning and prescribed fire treatments would be implemented outside the breeding seasons of most wildlife species.

Cultural Resources:

- Prior to project implementation, an archeologist meeting the Secretary of the Interior's standards would inventory unsurveyed areas for cultural resources;
- Protection and mitigation measures for known cultural resource sites, especially those vulnerable to fire and situated in or near the project area, would be assured before a prescribed fire project is initiated.
- Fuels would be carefully removed near culturally altered trees, historic buildings, and other cultural resources vulnerable to fire or post-fire impacts;
- Fuels removal would be accomplished under the direction of a resource professional;
- Heavy fuels (stumps) that could not be removed from cultural sites would be cut flush with the ground and buried using sterile soils;
- Define work-limits in the vicinity of important cultural resources,
- Monitor fire management activities, and halt work if previously unknown resources are located;
- Protect and record newly discovered resources;
- Brief work crews about the need to protect any cultural resources encountered, and instruct them regarding the illegality of collecting artifacts on Federal lands. This would include instructions for notifying appropriate personnel if human remains were discovered;
- Identify suitable slash disposal areas lacking cultural sites (both on-site and off-site);
- Avoid ground-disturbing activities in areas containing cultural sites;
- Vehicles would access the work areas via non-sensitive routes;

- No mechanized equipment would be used within archeological site boundaries;
- Avoid and protect dendroglyph trees (culturally altered trees) during selective thinning and limbing;
- The National Park Service would work with tribes and with work crews to protect ethnographic resources;
- Prior to implementation of the preferred alternative, identify and protect character-defining elements of the monument's cultural landscapes;
- No vegetation would be removed that would impact character-defining elements of the landscape adversely; and
- Establish fire lines outside the visual perimeter of areas defined as a *potential* cultural landscape.

Paleontological Resources:

- Protection and mitigation measures for known paleontological resources in or near the project area must be assured before a prescribed fire project is initiated.
- Prior to project implementation, inventory any areas where paleontological resources may be present, but have not been previously identified;
- Isolate paleontological sites that are vulnerable to fire or to human activities associated with suppression activities, and flag them for avoidance or treatment;
- At vulnerable paleontological sites, remove heavy fuels that cause long-duration heating;
- Educate fire treatment personnel about known paleontological locations and the need to protect fossils encountered during fire suppression activities;
- Minimize ground disturbance, including construction of helispots, when possible;
- Fire control lines would not be permitted through areas with paleontological resources;
- Conduct post-fire resource survey to identify and evaluate newly discovered fossils and/or document damage to known fossil sites;

- Develop a plan to ensure stabilization or information retrieval from paleontological sites in burned areas; and
- During rehabilitation of fire control lines or burned areas, exercise care to avoid damage to paleontological resources.

Socioeconomic Resources:

- All fire management activities will consider safety of personnel and the public as the highest priority.
- No fire management operations will be initiated until all personnel involved receive a safety briefing describing known hazards and mitigating actions (Lookout, Communications, Escape Routes and Safety Zones), current fire season conditions and current and predicted fire weather and behavior.
- Monument neighbors, park visitors and the local residents will be notified of all planned and unplanned fire management activities that have the potential to impact them.
- All park closures are at the discretion of the Superintendent.

ALTERNATIVES CONSIDERED BUT REJECTED

Several alternatives for fuels management were considered but rejected early in the evaluation process. These alternatives and the reasons they were not considered further are described below.

Manual Clearing. Manual clearing using chainsaws would require extensive staff resources and create cut vegetation disposal problems. To mechanically treat the entire monument would be logistically impractical and would impose excessive burdens on staff resources. Furthermore, the use of mechanical treatments alone would not meet the objective of maintaining or restoring natural resources and their processes.

Prescribed Burn. Suppression of fire within the monument has altered the natural fire regime and has resulted in a large build-up of fuel. Prescribed burning without extensive thinning may result in the inability to precisely control burn areas which represents a high risk to properties and human health and safety. Prescribed burning without prior fuels reduction would not meet the objectives and was not further analyzed.

Wildland Fire Management for Resource Benefit. This alternative would permit wildland fires to burn with monitoring to benefit natural resources in the

monument. Because of the limited size of the park, the amount of fuel build-up resulting from past fire suppression, and the presence of properties adjacent to the monument, this alternative would pose a high risk of a large-scale fire which would threaten human health and safety, properties, and monument resources.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

As stated in Section 2.7.D. of *Director's Order #12 and Handbook* (NPS 2001a), the environmentally preferred alternative is the alternative that will promote the policies expressed in the National Environmental Policy Act (Sec. 101 (b)). This includes alternatives that:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

In the National Park Service, the no action alternative may also be considered in identifying the environmentally preferred alternative. Alternative A, continue current management/no action, represents the current management direction for Florissant Fossil Beds National Monument in conformance with the monument's general management plan (NPS 1985b), strategic plan (NPS 2000), and resource management plan (NPS 2001e). Alternative A would allow for the continued buildup of woody fuels in the treatment area, with an accompanying risk of wildfire. This type of event would produce adverse effects to many of the resources discussed in this assessment.

Alternative B, the preferred alternative, would reduce the risk of wildfire. In doing so, compared to the continue current management/no action alternative, Alternative B would:

- Reduce fuel loadings to a level that would mimic the behavior of natural, fire adapted conditions, and enhance the protection of resources for succeeding generations.
- Improve the safety, healthfulness, and esthetics of the surroundings.
- Reduce the risk to health and safety and other undesirable consequences of wildfire.
- Restore dominance of fire-adapted plant communities.
- Provide better protection of paleontological, cultural, and natural resources.

Therefore, Alternative B would be environmentally preferable over the continue current management/no action alternative (Alternative A).

Table 3: Objectives, and the Ability of the Alternatives to Meet Them

Objective	Alternative A: Continue Current Management/No Action	Alternative B: Preferred Alternative
Ensure firefighter and public safety	Although all standard fire protection safety measures would be followed to ensure firefighter and public safety, the potential for wildfire would continue to be high, potentially endangering both firefighters and public safety.	This alternative would reduce fuel loads thus decreasing the potential for wildfires and reducing their intensity. Thus, the danger to firefighters and the public would be decreased.
Reduce wildland fire hazards around developed areas, along interface boundary areas and adjacent to paleontological and cultural resources.	The infrequency and suppression of natural fires and the lack of mechanical fuels reduction would continue to permit fuel loads to build-up increasing the potential for wildfire which would adversely impact natural and cultural resources. Homes adjacent to the monument would also continue to be subjected to potential wildfires, endangering property.	The successful implementation of hand-thinning buffers and prescribed fire to reduce fuel loads along monument boundaries and around developed areas and vulnerable cultural and paleontological sites would reduce the risk of fires migrating onto private property or damaging monument resources.
Suppress all wildland fires to protect the public and monument resources.	All wildland fires would be suppressed regardless of ignition source.	Same as no action.
Manage prescribed and wildland fires in concert with federal, state, and local air quality regulations.	Smoke management reporting procedures for burning in Colorado will be followed for all prescribed fire operations	Management activities with appropriate mitigation measures would be implemented in such a way so as to have minimum impact on air quality. Prescribed fire would be implemented under a smoke management plan using defined smoke management practices.

Objective	Alternative A: Continue Current Management/No Action	Alternative B: Preferred Alternative
Manage wildland fires so that monument resources are protected from damage by suppression actions and fire.	Intense wildfire and associated large-scale suppression techniques could potentially occur with this alternative. Because paleontological and cultural resources are non-renewable and a large-scale wildfire would have long-term adverse effects, the current management approach would not meet the objective.	This alternative would lower the potential for wildfires and the need for large-scale fire suppression techniques. Reduced fuel loads would result in a long-term benefit to monument resources by making them less vulnerable to future fires.
Facilitate reciprocal fire management activities through development and maintenance of cooperative agreements and relationships with other fire management entities	This alternative would annually review and modify as necessary agreements with other agencies adjacent to the monument that are involved with fire management activities.	Same as no action.
Restore and maintain resources and their processes	Because of the infrequency and suppression of wildfires, fuel buildup would continue and the potential for a large-scale wildfire would remain resulting in adverse long-term effects to vegetative communities and decreasing the potential for reintroduction of fire-adapted vegetation.	Mechanical thinning practices would loosely mimic the thinning action of wildfire and implementation of prescribed burning would restore a missing ecological process in the fire-adapted communities that would be treated.

SUMMARY OF IMPACTS

Table 4 briefly summarizes the effects of each of the alternatives on the impact topics that were retained for analysis at Florissant Fossil Beds National Monument. More detailed information on the effects of the alternatives is provided in the “Affected Environment and Environmental Consequences” section.

Table 4: Comparison of Impacts of Alternatives

Impact topics	Alternative A: Continue Current Management /No Action	Alternative B: Preferred Alternative
Air quality	A widespread fire would produce short-term, minor to moderate, adverse, regional effects to air quality.	Effects of treatment activities would be direct and adverse, but short-term and localized. Mechanical treatments would result in negligible to minor impacts. Slash pile and prescribed burning, would cause some adverse, minor to moderate effects from smoke and particulate matter emissions. Benefits of reducing the potential for wildfire would offset the adverse effects.
Endangered or threatened and species and their habitats	No effect	No effect
Soils	In the event of a wildfire, short-term, direct, localized, negligible to moderate adverse effects would result. Small intensity wildfire would result in negligible to minor beneficial effects.	Alternative B would produce short-term, negligible to minor, highly localized effects on soils within the treatment areas. Adverse effects would be off set by the long-term, beneficial effects of negligible to minor intensity resulting from prescribed fire.
Vegetation	Alternative A would produce no short-term, direct effects to vegetative communities. Long-term, adverse effects would be, direct and indirect, local to regional, and range from minor to moderate, depending on the occurrence and severity of fire.	Alternative B would yield, local, short-term, negligible, adverse effects on vegetation. Long-term effects would be local to regional, beneficial, and minor, as the threat of migrating wildfire would be reduced.
Water quality and hydrology	In the event of a wildfire, there is potential for short- and long-term, minor to moderate, adverse effects from erosion and nutrient loading depending on the magnitude of a wildfire event.	Short-term adverse impacts from mechanical thinning treatments would be negligible to minor. Prescribed burning would have short- and long-term negligible to minor adverse effects depending upon the size of the treatment area.
Wetlands and Floodplains	In the event of a wildland fire, adverse effects would be short- and long-term, minor to moderate. Low intensity wildfire may result in negligible to minor benefits to wetlands through release of nutrients and improved soil productivity.	Mechanical thinning activities would result in negligible adverse effects. Prescribed fire would have adverse, short-term effects due to reduced vegetation but would also have minor beneficial effects through the release of nutrients and improved soil productivity.

Table 4: Comparison of Impacts of Alternatives

Impact topics	Alternative A: Continue Current Management /No Action	Alternative B: Preferred Alternative
Wildlife	Short-term, direct, negligible to moderate adverse impact would occur to wildlife as a result of a wildfire, suppression, and habitat rehabilitation efforts. Long-term, minor beneficial effects for wildlife would accrue as a result of the continuing increase in downed wood and snags.	Adverse effects of Alternative B would be short-term, local and negligible because of the relatively small areas of habitat disturbed. Direct disturbance effect of prescribed burning would be offset by not implementing treatments during the breeding season and by direct post-fire beneficial effects on wildlife habitat. Alternative B would have minor to moderate beneficial effects on wildlife through habitat restoration.
Cultural resources	Depending upon the intensity and scope of future wildland fires, direct and indirect adverse impacts on prehistoric and historic archeological resources, historic structures, ethnographic resources, and cultural landscapes from wildfires and fire suppression activities would be minor to moderate, short- and long-term.	With mitigation, only negligible to minor short- and long-term adverse impacts to archeological, historical, and cultural landscape resources would be expected. Reduction of fuels would have long-term, minor to moderate beneficial impacts on cultural resources by making them less vulnerable to future fires.
Paleontological resources	Depending upon the intensity and scope of future wildland fires and suppression efforts, direct and indirect adverse impacts on paleontological resources would be minor to moderate, short- and long-term,.	With mitigation, adverse impacts would be negligible to minor, short- and long-term and limited to previously unidentified resources. Long-term minor to moderate beneficial effects would result from reduced potential for wildfire and damage by suppression activities.
Economics	In the event of a wildfire, short and long-term, local and regional, adverse effects would be associated with the cost of suppression and loss of property, which could range from negligible to moderate.	The monument and local economy would experience long-term, negligible to moderate, indirect, benefits a result of the reduced potential for wildland fire.
Monument operations	The effects of the no action alternative would be direct, local, short-term, adverse, and minor to moderate in the event of a wildfire.	Alternative B would result in negligible, short-term, localized, adverse effects to monument operations from treatment implementation. Long-term effects to monument operations would be moderately beneficial and result from reduced exposure to potential wildfire.
Public health and safety	Alternative A would have an adverse, short- and long-term, minor to moderate effect on public health and safety in the event of a wildfire.	Effects to public health resulting from smoke emissions associated with prescribed burning would be short-term, local, adverse, and negligible. Long-term effects would be beneficial and minor to moderate from the reduced potential for wildfire in the monument.

Table 4: Comparison of Impacts of Alternatives

Impact topics	Alternative A: Continue Current Management /No Action	Alternative B: Preferred Alternative
Visitor use and experience	No action would have an adverse, short- and long-term, negligible to moderate, effect on the visitor experience, potentially limiting or restricting access to the monument due to smoke and concerns for visitor safety.	Direct, long-term, minor to moderate, beneficial effect on the visitor experience due the reduced potential for wildfire and an improved landscape scene. Short-term, negligible to minor, adverse effects would result from public access restrictions during management activities.

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AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

REGULATIONS AND POLICIES

A list of regulations and policies relevant to each impact topic is provided in Table 1.

METHODOLOGY

For each impact topic, the analysis includes a brief description of the affected environment and an evaluation of effects. The impact analysis involved the following steps:

- Identify the area that would be impacted.
- Compare the area of potential impact with the resources that are present.
- Identify the intensity, context, duration (short- or long-term), and type (direct or indirect) of effect, both as a result of this action and from a cumulative effects perspective. Identify whether effects would be beneficial or adverse. The criteria used to define the intensity of impacts associated with the analyses are presented in Table 5.
- Identify mitigation measures that may be employed to offset potential adverse impacts.

The impact analyses were based on professional judgment using information provided by park staff, relevant references and technical literature, and subject matter experts.

Table 5: Fire Management Plan Impact Threshold Definitions

Impact Topic	Impact Threshold Definition				Duration
	Negligible	Minor	Moderate	Major	
Air quality	No changes would occur or changes in air quality would be below or at the level of detection, and if detected, would have effects that would be considered slight and short-term.	Changes in air quality would be measurable, although the changes would be small, short-term, and the effects would be localized. No air quality mitigation measures would be necessary.	Changes in air quality would be measurable, would have consequences, although the effect would be relatively local. Air quality mitigation measures would be necessary and the measures would likely be successful.	Changes in air quality would be measurable, would have substantial consequences, and be noticed regionally. Air quality mitigation measures would be necessary and the success of the measures could not be guaranteed.	Short Term- Recovers in 7 days or less Long Term- Takes more than 7 days to recover
Endangered or threatened species and critical habitats	No federally listed species would be affected or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination in U.S. Fish and Wildlife Service terms.	The alternative would affect an individual(s) of a listed species or its critical habitat, but the change would be small and would be short-term. Minor effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species.	An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect would have some long-term consequence to the individual, population, or habitat. Moderate effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species.	An individual or population of a listed species, or its critical habitat, would be noticeably affected with a long-term, vital consequence to the individual, population, or habitat. Major effect would equate with a "may effect" determination in U.S. Fish and Wildlife Service terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species or critical habitat.	Plants Short Term- Recovers in less than 1 year Long Term- Takes more than 1 year to recover Animals Short Term- Recovers in less than 1 year Long Term- Takes more than 1 year to recover

Table 5: Fire Management Plan Impact Threshold Definitions

Impact Topic	Impact Threshold Definition				Duration
	Negligible	Minor	Moderate	Major	
Soil	Soils would not be affected or the effects to soils would be below or at the lower levels of detection. Any effects to soil productivity or fertility would be slight and no long-term effects to soils would occur.	The effects to soils would be detectable, but likely short-term. Effects to soil productivity or fertility would be small, as would the area affected. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and likely successful.	The effect on soil productivity or fertility would be readily apparent, long-term, and result in a change to the soil character over a relatively wide area. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.	The effect on soil productivity or fertility would be readily apparent, long-term, and substantially change the character of the soils over a large area in and out of the park. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.	Short Term- Recovers in less than 3 years Long Term- Takes more than 3 years to recover
Vegetation	No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be short-term, on a small scale, and no species of special concern would be affected.	The alternative would temporarily affect some individual native plants and would also affect a relatively minor portion of that species' population. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective.	The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population in the long-term and over a relatively large area. Mitigation to offset adverse effects could be extensive, but would likely be successful. Some species of special concern could also be affected.	The alternative would have a considerable long-term effect on native plant populations, including species of special concern, and affect a relatively large area in and out of the park. Mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed.	Short Term- Recovers in less than 3 years Long Term- Takes more than 3 years to recover

Table 5: Fire Management Plan Impact Threshold Definitions

Impact Topic	Impact Threshold Definition				Duration
	Negligible	Minor	Moderate	Major	
Water quality and hydrology	Neither water quality nor hydrology would be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight, local, and short-term.	Changes in water quality or hydrology would be measurable, although the changes would be small, likely short-term, and the effects would be localized. No mitigation measure associated with water quality or hydrology would be necessary.	Changes in water quality or hydrology would be measurable and long-term but would be relatively local. Mitigation measures associated with water quality or hydrology would be necessary and the measures would likely succeed.	Changes in water quality or hydrology would be readily measurable, would have substantial consequences, and would be noticed on a regional scale. Mitigation measures would be necessary and their success would not be guaranteed.	Short Term- Following treatment recovery will take less than one year Long Term- Following treatment recovery will take longer than one year
Wetlands and floodplains	Wetlands or floodplains would not be affected or the effects to the resource would be below or at the lower levels of detection. No long-term effects to wetlands or floodplains would occur and any detectable effects would be slight. No U.S. Army Corps of Engineers 404 permit would be necessary.	The effects to wetlands or floodplains would be detectable and relatively small in terms of area and the nature of the change. A U.S. Army Corps of Engineers 404 permit would not be required. No long-term effects to wetlands or floodplains would likely occur.	The alternative would result in effects to wetlands or floodplains that would be readily apparent, including a long-term effect on wetland vegetation, such that an U.S. Army Corps of Engineers 404 permit could be required. Wetland or floodplain functions would not be affected in the long-term.	Effects to wetlands or floodplains would be observable over a relatively large area, would be long-term, and would require a U.S. Army Corps of Engineers 404 permit. The character of the wetland or floodplain would be changed so that the functions typically provided by the wetland or floodplain would be substantially changed.	Short Term- Recovers in less than 1 year Long Term- Takes more than 1 year to recover

Table 5: Fire Management Plan Impact Threshold Definitions

Impact Topic	Impact Threshold Definition				Duration
	Negligible	Minor	Moderate	Major	
Wildlife	Wildlife would not be affected or the effects would be at or below the level of detection, would be short-term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the wildlife species' population.	Effects to wildlife would be detectable, although the effects would be localized, and would be small and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.	Effects to wildlife would be readily detectable, long-term and localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects, would be extensive and likely successful.	Effects to wildlife would be obvious, long-term, and would have substantial consequences to wildlife populations in the region. Extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed.	Short Term- Recovers in less than 1 year Long Term- Takes more than 1 year to recover
Cultural resources	The impact is at the lowest levels of detection – barely perceptible and not measurable.	For archeological resources, the impact affects an archeological site(s) with modest data potential and no significant ties to a living community's cultural identity. The impact does not affect the character defining features of a National Register of Historic Places eligible or listed structure, district, or cultural landscape.	For archeological resources, the impact affects an archeological site(s) with high data potential and no significant ties to a living community's cultural identity. For a National Register eligible or listed structure, district, or cultural landscape, the impact changes a character defining feature(s) of the resource but does not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized.	For archeological resources, the impact affects an archeological site(s) with exceptional data potential or that has significant ties to a living community's cultural identity. For a National Register eligible or listed structure, district, or cultural landscape, the impact changes a character defining feature(s) of the resource, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed in the National Register.	Short term- Treatment effects on the natural elements of a cultural landscape may be comparatively short-term (e.g., three to five years until new vegetation grows or historic plantings are restored, etc.) Long term- Because most cultural resources are non-renewable, any effects on archaeological, historic, or ethnographic resources, and on most elements of a cultural landscape would be long term.

Table 5: Fire Management Plan Impact Threshold Definitions

Impact Topic	Impact Threshold Definition				Duration
	Negligible	Minor	Moderate	Major	
Paleontological resources	The impact is at the lowest levels of detection – barely perceptible and not measurable.	For paleontological resources, the impact affects either fossil-bearing site(s) or a context site(s) with modest data potential, and the site/area is not part of a National Natural Landmark (NNL). Effects would be localized within a relatively small area and would usually be detectable. Mitigation measures, if needed to offset adverse effects, would be simple and successful.	For paleontological resources, the impact affects either fossil-bearing site(s) or context site(s) with high data potential, but the site/area is not part of a NNL. Although localized, the impact would be readily detectable, and would affect several species or an underreported species. Mitigation measures, if needed to offset adverse effects, would be extensive and generally successful.	For paleontological resources, the impact would be readily detectable and affect a fossil bearing site(s) [or a context site?] with exceptional data potential, with consequences on the regional or national level. The site(s) may be part of a NNL. If so, attributes contributing to inclusion in the NNL are affected adversely. Mitigation measures, if needed to offset adverse effects, would be extensive and may not be totally successful	Long term- Because paleontological resources are non-renewable, any effects on these resources would be long term.

Table 5: Fire Management Plan Impact Threshold Definitions

Impact Topic	Impact Threshold Definition				Duration
	Negligible	Minor	Moderate	Major	
Economic effects	No effects would occur or the effects to socioeconomic conditions would be below or at the level of detection. The effect would be slight and no long-term effects to socioeconomic conditions would occur.	The effects to socioeconomic conditions would be detectable. Any effects would be small and if mitigation is needed to offset potential adverse effects, it would be simple and successful.	The effects to socioeconomic conditions would be readily apparent and likely long-term. Any effects would result in changes to socioeconomic conditions on a local scale. If mitigation is needed to offset potential adverse effects, it could be extensive, but would likely be successful.	The effects to socioeconomic conditions would be readily apparent, long-term, and would cause substantial changes to socioeconomic conditions in the region. Mitigation measures to offset potential adverse effects would be extensive and their success could not be guaranteed.	Short Term- occurs only during the treatment effect Long Term- occurs after the treatment effect
Monument operations	Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.	The effect would be detectable and likely short-term, but would be of a magnitude that would not have an appreciable effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and likely successful.	The effects would be readily apparent, be long-term, and would result in a substantial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.	The effects would be readily apparent, long-term, would result in a substantial change in park operations in a manner noticeable to staff and the public and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed.	Short term- effects lasting for the duration of the treatment action. Long term- effects lasting longer than the duration of the treatment action.

Table 5: Fire Management Plan Impact Threshold Definitions

Impact Topic	Impact Threshold Definition				Duration
	Negligible	Minor	Moderate	Major	
Public health and safety	Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on the public health or safety.	The effect would be detectable and short-term, but would not have an appreciable effect on public health and safety. If mitigation were needed, it would be relatively simple and likely successful.	The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a local scale. Mitigation measures would probably be necessary and would likely be successful.	The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a regional scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.	Short term- Effects lasting for the duration of the treatment action. Long term- Effects lasting longer than the duration of the treatment action.
Visitor use and experience	Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative.	Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.	Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes.	Changes in visitor use and/or experience would be readily apparent and have important long-term consequences. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes.	Short Term- occurs only during the treatment effect. Long Term- occurs after the treatment effect.

Cultural Resource Analysis Method

Impacts to cultural resources are described in terms of type, context, duration, and intensity, as described above, which is consistent with the regulations of the Council on Environmental Quality (CEQ 1978) that implement the National Environmental Policy Act. These impact analyses also are intended to comply with the requirements of both NEPA and Section 106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impacts to cultural resources were identified and evaluated by:

- Determining the area of potential effects;
- Identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places;
- Applying the criteria of adverse effect to affected cultural resources either listed in or eligible to be listed in the National Register; and
- Considering ways to avoid, minimize or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualify it for inclusion in the National Register. For example, this could include diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternative that would occur later in time, be farther removed in distance or be cumulative (36 CFR Part 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish in any way the characteristics of the cultural resource that qualify it for inclusion in the National Register.

Council on Environmental Quality regulations (CEQ 1978) and *Director's Order #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001a) call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, such as reducing the intensity of an impact from major to moderate or minor. Any resulting reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under the National Environmental Policy Act only. It does not suggest

that the level of effect as defined by Section 106 is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effect remains adverse.

A Section 106 summary is included in the impact analysis for cultural resources. The summary is intended to meet the requirements of Section 106 and is an assessment of the effect of implementing the alternative on cultural resources, based on the criterion of effect and criteria of adverse effect found in the Advisory Council's regulations.

Cumulative Effects Analysis Method

The Council on Environmental Quality (CEQ 1978) regulations for implementing the National Environmental Policy Act require assessment of cumulative effects in the decision-making process for federal projects. Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative effects are considered for both the no-action and proposed action alternatives.

Cumulative effects were determined by combining the effects of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing, or reasonably foreseeable future actions at Florissant Fossil Beds National Monument and in the surrounding region. Other actions that have the potential to have a cumulative effect in conjunction with this wildland-urban interface project include:

- Any non-fire-related actions by the National Park Service in the monument, such as resource restoration projects.
- National Park Service fire related education efforts.
- Fire management and/or forest management actions by other federal agencies, such as the U.S. Forest Service.
- Resource development on both public and private lands in the vicinity, such as mining, timbering, and development of visitor facilities.
- Conversion of private lands outside the park to other uses, such as pasturage, agricultural production, transportation corridors, and urban development.

Impairment Analysis Method

National Park Service *Management Policies* (NPS 2001f) requires analysis of potential effects to determine whether or not actions would impair park resources or values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, actions that would adversely affect park resources and values.

These laws give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute an impairment. Impairment may result from NPS activities in managing the park, from visitor activities, or from activities undertaken by concessionaires, contractors, and others operating in the park. An impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

A determination on impairment is included in the impact analysis section for all impact topics relating to park resources and values.

AIR QUALITY

Affected Environment

The Clean Air Act also provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts. National Park Service policies call for air resource management to be integrated into National Park Service operations and planning and for all air pollution sources within parks to comply with all federal, state, and local air quality regulations.

Florissant Fossil Beds National Monument is in a Class II airshed. In Class II airsheds, air quality exceeds the national Ambient Air Quality Standards, but moderate increases in new pollution may occur. The major population centers of Colorado Springs, Pueblo, and Denver are 30, 50, and 65 miles away, respectively. There is no visual indication that air quality at the monument is affected by these areas. Currently there is no air quality monitoring in place and there are no background measurements at the monument (NPS 2001e).

Growth in local communities and nearby development may result in minor air pollution increases over time. In addition, planned activities in and near the monument may affect local air quality. During a wildfire event, high concentrations of carbon monoxide, other gases, and particulate matter can be released. These emissions have potential health effects. In addition to potential health effects, wildfire smoke could affect visibility in the monument.

National Park Service fire management activities which result in the discharge of air pollutants are subject to, and must comply with, all applicable federal, state, interstate, and local air pollution control requirements. In accordance with U.S. Environmental Protection Agency policy (1998) described in the "Interim Air Quality Policy on Wildland and Prescribed Fires," Colorado requires that a permit for open burning be obtained prior to prescribed burning. The National Park Service will submit an application that includes plans to manage emissions, shows model results of predicated air quality impacts in the Colorado Springs area, and indicates smoke mitigation techniques. Smoke mitigation measures will be employed to minimize impacts to visibility and air quality within monument and surrounding areas. Burn plans would be prepared by monument staff prior to any burning.

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Alternative A would not alter the quantities of fuel loads in the monument. As fuel loads increased over time, the risk of wildfire would increase. A widespread fire would produce short-term, adverse, minor to moderate regional

effects to air quality as large quantities of pollutants, primarily particulates, were released to the atmosphere. Indirect effects from these air emissions would include impaired visibility along roadways, reductions in recreational values at scenic vistas, and health effects to residents and visitors with respiratory ailments.

Cumulative Effects. Growth in local communities may result in minor air pollution increases over time. Fuels management actions in the surrounding Pike National Forest include the use of prescribed fire and wildland fire in ecosystem restoration. Coincident fires in the adjoining public lands, along with the cumulative effects from other sources of air pollutants, could have minor to moderate, short-term, adverse effects on regional air quality.

Conclusion. A widespread fire would produce short-term, minor to moderate adverse, regional effects to air quality. Indirect effects from these air emissions would include impaired visibility along roadways, reductions in recreational values at scenic vistas, and health effects to residents and visitors with respiratory ailments.

Alternative A would not produce major adverse impacts on air quality resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of air quality resources or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. Alternative B includes mechanical thinning, chipping, spreading, slash pile burning, and prescribed burns. Thinning, chipping, and spreading would produce negligible short-term, adverse effects to air quality from emissions from the engines of vehicles that transported crews and equipment to work sites. Short-term dust emissions would be produced as vehicles transported workers along dirt roads. Operation of the chipper would produce engine emissions and dust. This would be a negligible, short-term, adverse effect to air quality compared to Alternative A. Mechanical control would be repeated periodically to effectively control vegetation. None of these emissions sources would have an appreciable effect on local air quality.

Additionally, this action would produce a zone within which firefighters may be able to gain control of a wildland fire and prevent it from crossing the monument boundary. This situation would reduce smoke emissions associated with wildfire

and would produce minor to moderate, short-term, beneficial effects to air quality compared to Alternative A.

Prior to implementing slash burning, a Colorado permit would be obtained. All slash burning activities would be performed in the Interface Fire Management Unit and would conform with state and national standards and meet stipulations in the burn permit. These highly controlled burns would only be conducted under conditions when there was little risk that the fire would escape. The use of mitigations techniques, in concert with the slash piles' limited fuel content, would produce negligible to minor, short-term, adverse effects to air quality. Adverse effects on visibility would be local and minor if the observer were in close proximity to, and downwind of, the fire. Indirect effects from the burning of slash piles would be negligible.

Due the expected short duration of the prescribed fires, minor to moderate short-term, direct adverse impacts to air quality are anticipated. Planned burning events require a permit that necessitates modeling to determine air quality and smoke impacts. When conditions were unfavorable for smoke dispersion and air quality standards would be threatened, prescribed ignitions would be postponed. Mitigation measures would be used to minimize or offset potential adverse effects. The monument staff would suppress prescribed fires if any of the parameters in the burn plan are being exceeded or are predicted to be exceeded. All burning activities would be performed in conformance with state and federal standards and with stipulations in the burn permit. Local communities would be notified in advance of management-ignited prescribed fires.

Additionally, implementation of the preferred alternative would result in a beneficial effect to air quality in the long-term. These beneficial effects would result from the reduced potential for catastrophic wildfires. The severe adverse effects on air quality, particularly to visibility, locally and regionally, that result from wildfire would be less likely after fuel loads were reduced. The abundance of private development at the wildland-urban interface adds to the potential for disastrous fires, and actions taken to reduce this potential adverse effect to air quality would be beneficial.

Cumulative Effects. Air quality effects from any of the alternatives would be short-term. Therefore, there would be little cumulative effect on air pollution, either locally or regionally. Cumulative effects of smoke from other sources, such as automobile and fireplace emissions could have minor adverse impacts during inversions. Nearby developments may result in minor air pollution increases over time. However, if these external sources of air pollution were combined with a wildfire in the monument, the impacts, although short-term, could be moderately adverse to the regional system. Cumulative effects to regional air quality could range from minor to moderate adverse direct effects, depending on the timing

and size of other emissions that would coincide with fire events on the monument.

Fire management activities in the surrounding Pike National Forest include the use of prescribed fire and wildland fire to meet management objectives. Prescribed burning and treatment of slash piles in the monument, coincident with large-scale Forest Service activities, would contribute to regional air quality effects. With planning, mitigation, and coordination between the monument and other potential point sources in the area, the cumulative effects of slash pile and prescribed burning on regional air quality would be adverse, temporary, and negligible.

Conclusion. During the treatment period, potential air quality effects would be direct and adverse, but short-term and localized. Mechanical treatments would result in negligible to minor adverse effects on air quality. Slash pile and prescribed burning, would cause some adverse, direct, short-term, localized smoke and particulate matter emissions. Effects could range from minor to moderate. Effects in comparison to Alternative A would be beneficial in the long-term because the preferred alternatives reduces the potential production of large volumes of air pollutants from wildland fires. These benefits would more than offset the negligible to moderate, short-term, adverse effects to air quality that would be associated with implementing any of the action alternatives.

Alternative B would not produce major adverse impacts on air quality resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of air quality resources or values as a result of the implementation of Alternative B.

ENDANGERED OR THREATENED SPECIES

Affected Environment

The U.S. Fish and Wildlife Service list of endangered, threatened, proposed, and candidate species with potential to occur in Teller County, Colorado, is provided in Table 6 below. There are no designated critical habitats in Florissant Fossil Beds National Monument.

Table 6: Endangered, Threatened, Proposed, and Candidate Species with Potential to Occur in Teller County, Colorado

Common Name	Scientific Name	Federal Status
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened
Pawnee montane skipper (butterfly)	<i>Hesperia leonardus montana</i>	Threatened
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	Candidate

Impacts of All Alternatives

Analysis. None of these species are residents of, nor do they regularly use, the habitats in the monument. The U.S. Fish and Wildlife Service has consulted with the monument staff and determined that management activities within the monument would not affect any listed species.

As a result of the “no effect” determination by the U.S. Fish and Wildlife Service, none of the fire management plans, activities, or alternatives (including the no-action alternative) would affect any endangered, threatened, proposed, or candidate species, or any designated critical habitat, in Florissant Fossil Beds National Monument.

Alternative A or B would not produce major adverse impacts on endangered, threatened, or proposed species or their designated critical habitats whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument’s general management plan or other National Park Service planning documents. Consequently, there would be no impairment of endangered, threatened, proposed, or candidate species or any designated critical habitat as a result of the implementation of Alternative A or B.

SOILS

Affected Environment

The soils of the area are characterized by decomposed granite and alluvial materials. There are many rocky outcroppings of Pikes Peak granite within the monument. The soil has poor cohesive qualities and erodes easily once the surface vegetation is disturbed. In areas where volcanic tuff and lake shales are present, clay and silty clay soil types are predominant. These also are highly

susceptible to erosion following surface disturbance. The Soil Conservation Service completed an Order 3 soil Survey of the monument in 1986 (NPS 2001e).

Past land use practices, grazing, and the construction of earth-filled dams in the 1950s, have reduced vegetative cover and exposed soils to sheet and gully erosion in some areas. There are approximately 50 miles of terracing. A 1998 inventory found 44 dams of potential safety concern. To slow gully erosion along Lower Twin Rocks Road, 10 check dams and riprap were built in September 1990.

Impacts of Alternative A, Continue Current Management/No Action

Analysis. In the absence of wildfire, Alternative A would have negligible to minor adverse effects on soil in the fire management units. As nutrients are sequestered in standing and dead vegetation, soil productivity is reduced (Munshower 1994). Continued fire suppression increases fuel loads, which may lead to wildfire. The impact of wildfire on soils is dependent on the severity of the fire and the water content of the soil. High intensity fire eliminates organic cover, decreases soil nutrients, and increases pH. Severe fire temperatures may also kill mycorrhizae and microbes responsible for nutrient cycling. Soil hydrology can be altered in a variety of ways, from increased infiltration to the formation of hydrophobic soils. Such alterations can lead to increased erosion (Anderson 1996). The direct effects of wildfire are generally short-term, minor to moderate and localized. The indirect effects of accelerated erosion and increased sedimentation may persist for several years.

Firefighting activities could also have negligible to minor, direct, short-term adverse effects on soils under Alternative A. Suppression efforts may involve the use of heavy equipment, which would increase soil compaction. The construction of firebreaks would directly disturb the soil. However, effects in highly compacted soils, such as bulldozer tread marks, would be sufficiently reduced by natural processes to allow plant growth within three years (Blatt 1999). To assure recovery of soils, mitigation and rehabilitation actions following firefighting activities would be necessary.

Low-intensity wildfires that might occur under Alternative A could have short-term, negligible to minor, beneficial effects on soils. These effects could include increased availability of nutrients, enhanced water infiltration capability, and reduced incidence of forest pathogens (Bauder 2000).

Cumulative Effects. Historic land use in the Florissant Fossil Beds area included grazing of cattle and sheep. Domestic livestock have degraded local soils in some areas by over-utilization of vegetative cover and subsequent erosion. The resulting increase in sedimentation was initially addressed by the installation of 44 earthen dams throughout the monument. Now that grazing has ceased, these dams serve to interrupt normal hydrology and sediment transport regimens in many drainages. In the event of a wildfire, Alternative A combined

with these other past activities would result in minor to moderate adverse effects on soil productivity that would be recovered over time.

The nearby Pike National Forest is pursuing fuel load reduction strategies. Their efforts would increase protection of soil resources in the area and reduce the potential for large-scale fire suppression. The no action alternative would not contribute cumulatively to these beneficial effects.

Conclusion. In the absence of wildfire, Alternative A would have no effects on monument soil resources. In the event of a wildfire, short-term, negligible to moderate, direct, localized adverse effects would result. The intensity of these effects would depend on the location and severity of the wildfire occurrence. Small intensity wildfires would result in negligible to minor beneficial effects.

Alternative A would not produce major adverse impacts on soil resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of soil resources or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. The short-term direct effects of Alternative B are related to mechanical fuels reduction activities, slash-pile burning, and the use of prescribed fire. Thinning and limbing activities would have negligible to minor, short-term, localized, direct adverse effects on soils compared to Alternative A. Access to work sites, dragging of slash and downed timber would create negligible to minor soil disturbance and compaction. Because the treatment areas have low slopes, there would be little change in erosion.

Dispersal of slash and chipping and distributing activities would have minimal effects on soil resources. Decomposition rates are slow in this semi-arid environment, and nutrients would be released slowly into the soil (Munshower 1994).

The burning of slash piles could produce temperatures hot enough to kill regenerative plant tissues in the soils immediately under the burn area (Anderson 1996). The effects would be negligible because these areas would be quite small, and seed sources would be readily available from nearby plants. The nutrients in the ash could increase the fertility of the soils under the burns (Bauder 2000).

Low-intensity, prescribed fire would have negligible to minor, beneficial impacts on soil fertility (Bauder 2000). This would occur directly as minerals and nutrients are released during combustion, and indirectly by increasing decomposition

rates. Low-intensity fires provide regenerative processes for soil and vegetation in the spruce-fir environment (USFS 2001).

The reduction of fuel loading and creation of a defensible zone or firebreak across the monument would create long-term beneficial effects to soils, as the potential for severe wildfire would be reduced.

Cumulative Effects. Historic land use in the Florissant Fossil Beds area included grazing of cattle and sheep. Domestic livestock have degraded local soils in some areas by over-utilization of vegetative cover and subsequent erosion. The resulting increase in sedimentation was initially addressed by the installation of 44 earthen dams throughout the monument. Now that grazing has ceased, these dams serve to interrupt normal hydrology and sediment transport regimens in many drainages. The activities of thinning and slash-pile burning would contribute negligibly to these past activities impacts on soil resources in the monument in the short-term.

The nearby Pike National Forest is pursuing fuel load reduction strategies. Their efforts, in concert with the proposed actions at Florissant Fossil Beds National Monument, would serve to protect local soil resources from the effects of wildfire and large-scale fire suppression. These benefits are long-term, negligible to moderate, and local to regional in scale. The short-term, negligible, adverse effects associated with treatment activities would be more than offset as high fuel loads are reduced and the risk of wildfire was reduced.

Under the preferred alternative, soils would experience short-term disturbance due to thinning activities and slash pile burning. Long-term impacts in the treatment area would be increased productivity and reduced risk of wildfire. Cumulative results would benefit the treatment area, as thinning increases herbaceous ground cover and nutrients are released.

Conclusion. Actions undertaken during implementation of Alternative B would produce short-term, negligible to minor, highly localized effects on soils within the treatment areas. Adverse effects would be off set by the long-term, negligible to minor beneficial effects from prescribed fire.

Alternative B would not produce major adverse impacts on soil resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of soil resources or values as a result of the implementation of Alternative B.

VEGETATION

Affected Environment

Florissant Fossil Beds National Monument lies within the eastern slope of the Rocky Mountains at an elevation of 8,200 feet to 8,900 feet in the Montane Life Zone. The monument is characterized by mountain meadows interspersed with open forests of ponderosa pine. Dense forest stands of Douglas fir and blue spruce can also be found on the hilltops and north facing slopes. Aspen trees are restricted to moist drainages throughout the area. Meadows occupy most of the area that falls within the boundaries of the prehistoric Florissant lakebed.

The Colorado Native Plant Society has collected and identified 443 species of vascular plants within the monument (NPS 2001e). Several exotic species of vegetation are now present due to historic land use practices. Plant communities at Florissant have been greatly affected by human activity, including (NPS undated):

- farming and grazing up to 1984;
- erosion due to grazing;
- construction of soil conservation features (dams);
- logging since the 1860s;
- various utility rights of way; and
- continued fire suppression.

The primary weed species present in the monument are Canada thistle, bindweed, and yellow toadflax. In 1999, seven significant alien species were mapped and prioritized for control efforts. Monument staff are currently implementing a comprehensive weed management program (T. Ulrich, pers. comm.).

The vegetative communities present in the fire management units are those found throughout the park. These communities evolved with fire, and in some cases, species depend on recurrent fire for their continued existence (NPS 2001c).

- On ridgetops and south-facing slopes, ponderosa pine stands occur with short grass and shrub (mountain mahogany and currant) understory. Canopy closure ranges from 20 to 60 percent, with minimal accumulation of dead/down fuels (NPS 2001d).

- Northern aspects support Douglas-fir, blue spruce, and occasional aspen. Dominant shrubs are creeping juniper and mountain mahogany. Crown spacing is tight, and ladder fuels are common, with heavy accumulations of litter and dead/down wood. This community type, located primarily in the southeastern portion of the monument, presents the greatest potential for increased fire (NPS 2001d). The boundary along this portion of the monument is targeted for treatment within the next five years (see Appendix B).
- Montane meadows are composed of native grasses and forbs, including Arizona fescue, mountain muhly, slender wheatgrass, golden banner, and Indian paintbrush (Colorado DNR 1998).

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Alternative A would continue current management of fire exclusion and suppression of all ignitions. Fuels loads within the monument and along the boundaries would continue to build-up. In the absence of wildfire, this alternative would produce no short-term effects on vegetation. Over the long-term, increased potential for wildfire would result in adverse, minor to moderate, effects on local plant communities. In addition, failure to address unnatural accumulations of litter and debris would compromise natural processes and reduce system productivity.

Cumulative Effects. Fuels management practices being undertaken by adjacent private landowners are not fully known at this time. The vegetative community types present within the monument extend onto private lands, and fuels accumulations beyond the boundary are consistent with those in the monument (NPS 2001c). This adds to the potential for wildfire to cross monument boundaries and affect adjacent forests and grasslands.

Pike National Forest, north of the monument, has implemented fuels management and prescribed fire within the forest (T. Ulrich, pers. comm.). Alternative A, eliminates participation by the monument in area-wide fire management plans. Adjoining public and private lands, as well as monument resources, would receive no increased protection from wildfire under Alternative A and defensible space would not be established within the monument boundaries. Continued implementation of this alternative would result in long-term, minor, adverse cumulative effects to vegetation.

Conclusion. In the absence of wildfire, Alternative A would produce no short-term, direct effects on monument vegetation. Over the long-term, increased potential for wildfire of unnatural intensity would result in minor to moderate, direct, adverse, effects to vegetative communities within the monument and on

surrounding properties. Indirect effects to monument vegetation would be long-term, adverse and minor as reduced productivity continues.

Alternative A would not produce major adverse impacts on vegetation resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of vegetation resources or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. Thinning and limbing activities would produce some short-term, adverse effects on monument vegetation. Disturbance from the actions of work crews, removal of individual trees, and dramatic thinning would produce highly localized, direct, negligible to minor effects to plant communities. However, long-term effects would be beneficial, as thinned areas more closely resemble natural conditions. The overall effects of the proposed action would be minor to moderate, beneficial, direct and indirect.

Dispersal of thinned material or wood chips would not be expected to have significant effects on vegetative communities. Material would not be placed in a manner that would compromise processes in these communities.

Burning of slash-piles would produce minor adverse effects to nearby vegetation. Vegetation beneath the piles would be killed, and heat could damage individual plants adjacent to the burn site. These effects would be negligible to minor, adverse, highly localized and short-term. Beneficial effects of slash pile burning would be indirect, negligible to minor, and short-term as nutrients are released into the soil (Anderson 1996).

Prescribed fire would produce beneficial effects in these vegetative communities. The low-intensity and short duration of prescribed burns would remove litter and debris, release nutrients, and help open the forest floor (Bauder 2000). The resulting conditions would more closely resemble the natural landscape. These effects would be long-term beneficial, minor, direct and indirect, and localized to the treatment areas.

Cumulative Effects. Implementation of Alternative B would provide a measure of protection against wildfire for adjacent vegetative communities, regardless of private fuels management. In addition, the proposed actions include the monument's cooperation in area-wide fire management plans. Vegetation on adjoining private lands, as well as monument resources, would benefit from

increased protection. This would result in long-term, minor, adverse, beneficial cumulative effects to vegetation.

Conclusion. Alternative B would yield localized, short-term, negligible, adverse effects on vegetation. Long-term effects would be local to regional, beneficial, and minor, as the threat of migrating wildfire would be reduced. Prescribed burning would result in a minor beneficial effect by restoring a critical element to these fire dependent systems.

Alternative B would not produce major adverse impacts on vegetation resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of vegetation resources or values as a result of the implementation of Alternative B.

WATER QUALITY AND HYDROLOGY

Affected Environment

There are numerous dry gulches and a number of intermittent spring-fed streams scattered throughout the monument. Several of these intermittent spring-fed springs converge to form Grape Creek, the only perennial stream within the boundary (NPS 2001b). Grape Creek, the major drainage, wanders along the Florissant valley from the south to the northwest (NPS 2001e). The water for these streams originates from rainfall and snowmelt percolating through soils from the watershed in and around the monument.

In the 1950 - 60s, approximately 44 earthen dams were constructed within the monument. Four of these dams permanently impound water and cause minor downstream effects. Some of the remaining dams have silted in to the point of that they no longer collect water (NPS 2001e). These earthen dams have over time altered the natural hydrologic and geomorphic processes of all the major and most minor drainages in the monument. In 2001, five of the dams were removed to help restore the natural drainage pattern to the monument.

Because agricultural land and residential subdivisions surround the monument, many individual wells and septic systems share the aquifer and watershed by the monument. This creates a potential for contamination of monument water from outside sources.

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Studies have suggested that severe physical and chemical post-fire effects in smaller streams occur shortly (1-2 years) after fires (Swanston 1991, Minshall and Brock 1991). Short-term effects of forest fires can include addition of sediment to streams which would increase in response to frequency or magnitude of precipitation events and extent of devegetation in burned areas (Christensen *et al.* 1989), increased channel erosion in stream sections where riparian vegetation has burned (Hansen 1990), and increased stream temperatures resulting from loss of forest canopy (Helvey *et al.* 1976). In severely burned watersheds, pronounced hydrological effects such as channel downcutting or displacement can produce long-term effects.

After a wildfire, chemistry of groundwater or surface runoff may be altered (Tiedemann *et al.* 1979). Changes in stream chemistry can include increased nitrate concentrations (Minshall and Robinson 1992), reduction in phosphate concentration, and variable patterns in other compounds such as major cations or anions (Stottlemeyer 1987).

In the event of a wildfire, short- and long-term, direct and indirect, minor to moderate impacts to water quality, aquatic habitat, and flow over time would occur. The effects are dependent on the intensity of the fire and the size of the area affected. The adverse effects of wildfire on water quality and hydrology would lessen over time with recovery of the riparian vegetation (Minshall *et al.* 1989).

Cumulative Effects. In the event of a wildfire, the effects on water quality and hydrology in the monument would include increases in the speed and volumes of runoff and in sediment loadings. Accelerated runoff and erosion would increase sediment in streams and channels and could cause earthen dams to become blocked by silt and debris. Failure of earthen dams due to increased flow could lead to scouring of downstream channels, sediment deposition downstream. This effect is slightly reduced by the removal of five earthen dams that will return the affected streambeds to natural patterns.

Grazing on lands adjacent to the park would continue to adversely affect regional water quality through nutrient loading and damage to riparian habitats that results in increased soil erosion and turbidity. Because of existing and growing development around the park, the regional water quality is at risk of contamination from failure of septic systems that occur in the watershed. This would lead to a degradation of water quality through the introduction of biological waste and nutrients into nearby waterways. The adverse effects of these activities, the earthen dams, and wildfire on water quality in the region would be long-term and moderate.

Conclusion. In the event of a wildfire, short- and long-term effects to water quality and hydrology would occur. There is potential for minor to moderate adverse effects from erosion and elevated nutrient levels depending on the magnitude of a wildfire event.

Alternative A would not produce major adverse impacts on water quality and hydrologic resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of water quality and hydrologic resources or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. Mechanical fuels reduction in the interface unit would result in the removal of individual trees or clumps of trees to achieve canopy spacing objectives. This would expose small patches of soils. Storm events following this mechanical treatment would result in temporary, limited increases in sediment, turbidity, and possibly nutrient increases downstream from management areas occurring on steep slopes or where soils were disturbed. Mechanical thinning activities would have short-term, negligible to minor adverse localized effects. The intensity of the impact is dependent upon the amount of vegetation removed. Over the long term, the re-establishment of native trees and plants would increase soil stabilization, improving water quality through decreased turbidity.

Slash pile burning would have no effect on water quality and hydrology with implementation of appropriate mitigation measures described above in the "Alternatives" section.

Due to existing conditions in areas to be treated with prescribed fire, negligible to minor impacts to water quality are anticipated in both the short- and long-term. Project area treatments would have an effect on suspended sediment loads and nutrient concentrations in nearby surface waters. Mitigation measures would be used to minimize the impacts associated with the prescribed burn. The duration of effects of prescribed burning in the open grasslands and meadows of the monument would be shorter than burns occurring in forested areas, as these vegetation types would recover quicker. A mosaic of vegetation left immediately adjacent to streams in prescribed burn areas would minimize the potential for erosion and increased runoff after a fire event. Small areas of unburned islands throughout each burn area would be left to help stabilize soil and reduce runoff.

Cumulative Effects. The adverse cumulative effects from management activities implemented under Alternative B would be associated with prescribed burning. Prescribed burning over a large area of land could result in accelerated runoff and erosion and subsequent increase in sediment in streams and channels. This increased sediment loading could cause earthen dams to become blocked by silt and debris. Failure of earthen dams due to increased flow could lead to scouring of downstream channels, sediment deposition downstream. This effect is slightly reduced by the removal of five earthen dams which will return the affected stream beds to natural patterns. The adverse effects on water quality of prescribed burning under Alternative B in combination with adverse regional effects of agriculture and development adjacent to the monument would be long-term and moderate. The contribution of adverse effects from Alternative B would lessen over time with recovery of streamside vegetation which would reduce soil erosion and subsequently reduce sedimentation and turbidity in monument drainages.

Conclusion. Mechanical thinning treatments would have localized, short-term, negligible to minor adverse effects on water quality and hydrology. With implementation of mitigating measures, burning debris in slash-piles would have no effect. Prescribed burning would have short- and long-term, negligible to minor adverse effects depending upon the size of the area treated.

Alternative B would not produce major adverse impacts on water quality and hydrologic resources and values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of water quality and hydrologic resources or values as a result of the implementation of Alternative B.

WETLANDS AND FLOODPLAINS

Affected Environment

The monument is relatively dry and receives only twelve to sixteen inches of rain and approximately 70 inches of snow annually. There are numerous dry gulches, a number of intermittent spring-fed streams, and a perennial stream within the monument. Naturally functioning wetlands, floodplains and riparian areas, associated with many of the drainages in the monument, are one of the most valuable natural resources in the monument not only due to their intrinsic value but also because of the area's relatively dry climate.

In the 1950s – 60s before the monument was established, area landowners and the Soil Conservation Service installed earthen dams in the monument for water retention and erosion control. A total of 44 earthen dams have been identified in the monument. Four of these dams permanently impound water (NPS 2001b). The dams result in the expansion of wet meadows, which provide habitat for wetland vegetation, from alteration of surface water flow in the monument. These dams however also adversely affect naturally occurring wetlands in the monument through alteration of the natural hydrologic and geomorphic processes (NPS 2001b).

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Under this alternative there would be an increased potential for a wildfire. Such a fire would cause short- and long-term, direct and indirect, minor to moderate, adverse effects to wetland resources. The loss of vegetation within and surrounding wetlands would affect nutrient cycling and leaf litter deposition. Loss of vegetation around the wetland and/or upstream of the wetland would result in increased runoff which would lead to increased sedimentation and turbidity. Short-term, beneficial effects from low-intensity wildfire would result from the release of nutrients and mineral cycling which positively affect soils and vegetation. Fire also plays a role in establishing and maintaining some wetland plant communities (USGS 2001). The beneficial effect of wildfire on wetlands would range from negligible to minor dependent upon the intensity and magnitude of the fire.

Cumulative Effects. Adverse cumulative effects would be those associated with increased risk of fire. The monument has removed 5 of the 44 earthen dams to restore natural hydrologic processes. This is expected to have long-term adverse impacts to wetlands that were created from dam construction (NPS 2001b). Wetland plants associated with the reservoirs would be lost and replaced with upland plant communities. In the event of a wildfire, the adverse effects of the no action alternative combined with the dam removal would result in long-term minor effects on wetlands and floodplains.

Under this alternative, the occurrence of a wildfire event in the monument would benefit wetlands and floodplains by allowing for establishment of native vegetation and improvements of soils around naturally occurring wetlands. Earthen dams have altered the natural hydrologic and geomorphic processes in the monument impacting the structure and function of naturally occurring wetlands and floodplains. Removal of the dams could restore wetland and riparian communities in the natural stream channels and drainages. The effects of a wildfire in concert with earthen dam removal would have minor beneficial cumulative effects on naturally occurring wetlands through the re-establishment of natural resources and processes.

Conclusion. In the event of a wildfire, destruction of wetland vegetation would increase run-off and sedimentation that would result in short- and long-term, minor to moderate, indirect, adverse effects to the resource. Beneficial effects would result from a low intensity wildfire through release of nutrients and improved soil conditions.

Alternative A would not produce major adverse impacts on wetland or floodplain resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of wetland or floodplain resources or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. Under this alternative, mechanical thinning activities would have short-term negligible effects on wetlands. These impacts would primarily result from the disturbance of soils and trampling of vegetation by workers in treatment areas adjacent to wetlands. Using best management practices, debris removed from treatment areas would not be transported and distributed and slash piles would not be burned in wetland areas. These activities would not have an effect on wetlands. Wetlands would not be avoided during prescribed burning activities that would occur in both the Interface and Wildland Fire Management Units. Riparian vegetation upstream of wetlands and vegetation surrounding wetlands would be lost due to use of prescribed burning resulting in an increase in sedimentation into the wetlands during storm events causing short-term adverse effects. Prescribed fire would also have short-term beneficial effects on wetland soils through the release of nutrients, mineral cycling, and native plant development (USGS 2001). These effects on wetlands would be minor.

Cumulative Effects. The use of prescribed fire would add cumulatively to the adverse effects on wetlands of earthen dam removals in the monument as described above. The cumulative effect would be long-term and minor to moderate depending on the number of wetlands affected during fire management activities. The reintroduction of fire into the monument under the preferred alternative would aid in the restoration of native vegetation around naturally occurring wetlands in the monument. The actions occurring under the preferred alternative in concert with earthen dam removal projects would have moderate beneficial cumulative effects on naturally occurring wetlands through the restoration of natural resources and processes.

Conclusion. Mechanical thinning activities would result in negligible adverse effects on wetlands and floodplains. Prescribed fire would have short-term

adverse effects through the reduction of wetland and riparian vegetation but restoration of fire in the wetland habitat would aid in restoring natural processes and native vegetation.

Alternative B would not produce major adverse impacts on wetland or floodplain resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of wetland or floodplain resources or values as a result of the implementation of Alternative B.

WILDLIFE

Affected Environment

Florissant Fossil Beds National Monument is located in the montane forest zone of the Southern Rocky Mountain physiographic province at an average elevation of about 8,500 feet above sea level. This area is characterized by typical montane communities, including grassland meadows and ponderosa pine, Douglas fir, spruce, and aspen forests. A diverse wildlife population uses these habitats and common bird and mammal species found in the monument are presented in Table 7 below.

Table 7: Common Bird and Mammal Species of Florissant Fossil Beds National Monument

Common Name	Scientific Name
<i>Birds</i>	
Golden eagle	<i>Aquila chrysaetos</i>
Great horned owl	<i>Bubo virginianus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Black-billed magpie	<i>Pica hudsonia</i>
Common raven	<i>Corvus corax</i>
Steller's jay	<i>Cyanocitta stelleri</i>
Northern flicker	<i>Colaptes auratus</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Mountain bluebird	<i>Sialia currucoides</i>
Brown creeper	<i>Certhia americana</i>
Mountain chickadee	<i>Parus gambeli</i>

Table 7: Common Bird and Mammal Species of Florissant Fossil Beds National Monument

Common Name	Scientific Name
<i>Mammals</i>	
Deer mouse	<i>Peromyscus maniculatus</i>
Abert's squirrel	<i>Sciurus aberti</i>
Porcupine	<i>Erethizon dorsatum</i>
Badger	<i>Taxidea taxus</i>
Coyote	<i>Canis latrans</i>
Black bear	<i>Ursus americanus</i>
Mountain lion	<i>Felis concolor</i>
Mule deer	<i>Odocoileus hemionus</i>
Elk	<i>Cervus canadensis</i>

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Alternative A would result in a continuation of current management practices, including full suppression of wildfires in all zones. No actions to reduce fuel loads would be implemented. In the event of a wildfire, the heavy fuel loads would likely create fire conditions that would be more severe and suppression measures would require a greater effort than if fuel loads were reduced. Assuming that such a fire would eventually occur, the effects to wildlife would primarily be short-term, direct, and the intensity of the impacts would range from negligible to moderate, depending on the magnitude of the wildfire and the suppression effort. There would be disturbance to wildlife species directly as a result of the fire, from suppression activities, and later as a result of habitat rehabilitation efforts. Most wildlife are mobile enough to avoid direct fire-related mortality and direct adverse effects would be locally negligible to minor as a result of disturbance and relocation. However, a fire during the breeding season could have a direct, moderate adverse effect on some wildlife species, particularly nesting bird and small mammal species (Erwin and Stasiak 1979 in Smith 2000). Retention of all downed wood and snags in the monument would provide important habitat for wildlife (Brown and Bright 1997 in Smith 2000), resulting in a long-term, minor beneficial impacts to wildlife species reliant on such habitat features such as cavity nesters (e.g., hairy woodpecker, mountain bluebird, northern flicker) and small mammals.

Cumulative Effects. A wildfire event under no-action conditions would have a greater potential for crossing the monument boundary, either entering or leaving

the monument, and suppression efforts inside or outside of the monument would contribute to negligible to moderate, direct, adverse cumulative effects on wildlife. The range of effects would be a result of the uncertainty associated with the severity of a wildfire and also would be related to the differing degree of wildfire prevention efforts undertaken on neighboring private lands.

Conclusion. Under the no-action alternative, a short-term, direct, negligible to moderate adverse impact would occur to wildlife as a result of a wildfire, suppression, and habitat rehabilitation efforts. Long-term, minor beneficial effects for wildlife would accrue as a result of the continuing increase in downed wood and snags. However, this benefit would be offset by a greater fire risk and the increased fire intensities associated with additional fuel loads.

Alternative A would not produce major adverse impacts on wildlife resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of wildlife resources or values for as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. Thinning forest stands and piling and burning of slash in relatively small piles would represent a minor adverse effect to wildlife. Local habitat may be affected as a result of burning slash piles. The effects of thinning and either scattering, chipping or burning slash piles would be adverse, short-term, local, and negligible to minor for wildlife because the disruption or destruction of habitat and foraging areas would be limited to small areas. Populations of some small mammals, including ground squirrels, pocket gophers, and deer mice, typically increase following fire (Ream 1981 in Smith 2000) and this indirect, local, minor beneficial effect on wildlife would be associated with prescribed burn treatments.

Wildlife mortality would be negligible due to the mobility of larger wildlife (Smith 2000) and availability of secure refuges in burrows, rock crevices, and under moist forest litter for small mammals (Ford et al. 1999 in Smith 2000). Prescribed burns would have a direct, local, minor adverse effect on wildlife because the treatments would be implemented outside the breeding seasons of most species, thus avoiding mortality of immobile juveniles, which is an adverse effect highly associated with broad-scale fire (Erwin and Stasiak 1979 in Smith 2000). Retention of some downed wood and snags in both thinned and prescribed burn treatment areas would provide very valuable habitat for wildlife (Brown and Bright 1997 in Smith 2000) resulting in long-term, minor beneficial impacts to wildlife. In ponderosa pine forests, forage quantity typically increases following fire

treatments (Oswald and Covington 1983 in Smith 2000) and the nutritional quality of forage plants typically increases for one to three years following fire (Meneely and Schemnitz 1981 in Smith 2000). These responses would reflect indirect, local, minor beneficial effects of the preferred alternative. Measures would be employed to minimize potential adverse effects to wildlife species.

Cumulative Effects. The preferred alternative would be consistent with the ecosystem restoration objectives of the monument's resource management plan (NPS 2001e). As a result, the proposed action would provide a park-wide, minor to moderate beneficial effect by aiding efforts to restore the monument's ecosystems to pre-settlement conditions, which in turn would represent a benefit to wildlife.

The National Park Service fuel management actions associated with the Interface Fire Management Unit would support educational efforts by the interagency fire management cooperative aimed at nearby private landowners. These efforts encourage private landowners to maintain defensible spaces around their homes and properties, not only for their own protection, but to be compatible with National Park Service fuel management actions adjacent to the private lands. Successful education, implementation of fire protection measures, and cooperation with regional firefighting organizations, in conjunction with the management strategies proposed in the fire management plan, would have a moderate, regional, beneficial cumulative effect by decreasing the potential for wildfire ignition and spread, thus protecting wildlife habitat inside and outside the monument.

Conclusion. The adverse impacts to wildlife associated with Alternative B would be short-term, local and negligible because of the relatively small areas of habitat that would be disturbed in the case of the thinning and pile burning, and because the direct disturbance effect of prescribed burning would be offset by not implementing treatments during the breeding season and by direct post-fire beneficial effects on wildlife habitat. Alternative B would best meet the ecosystem restoration objective and this would represent a minor to moderate beneficial effect for wildlife because species' habitats would be restored to conditions more similar to those associated with a full complement of ecosystem processes.

Alternative B would not produce major adverse impacts on wildlife resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of wildlife resources or values for as a result of the implementation of Alternative B.

CULTURAL RESOURCES

Prehistoric Resources

Although few of the sites at Florissant Fossil Beds National Monument have been dated, artifacts found here suggest that prehistoric peoples were using this area as early as about 8,000 B.C. (Olson et al. 1974:10), and continued to use the area well into the historic period.

The monument is located at the juncture of two important physiographic regions of Colorado, the mountains and the plains. Prehistoric peoples may have used the monument area to hunt and gather in a seasonal round, moving from the plains and lower foothills into the mountains. This area also may have served as a type of intermediate base camp for exploitation of resources in the foothills (NPS 1985a:2-3).

A total of 28 prehistoric sites, including isolated features and artifacts, have been documented within the monument. Two of the 28 archeological sites have both prehistoric and historic components. The majority of the prehistoric sites are lithic scatters, which may be related to lithic procurement (quarrying) and tool production (chipping stations or workshop areas). Other types of sites include campsites and rock shelters. Sites are most often located in the open terraces above drainages with a good view of the valley below.

Historic Resources

Early travelers through the area, including Juan Bautista de Anza in 1779, Zebulon Pike in 1806, Major Stephen Long (1820), and Lt. John Fremont (1843-1844) left few traces on the landscape. Trappers, traders, and gold seekers followed an ancient Ute Trail which passed nearby (NPS n.d.a by M. Culpin). The town of Florissant was begun as a ranch, trading post, and hotel complex in 1870, later prospering as a transportation and supply terminal with area silver strikes in the 1880s.

The monument's historic resources primarily represent the influx of settlers who came to this area during the late 1800s following passage of the Homestead Act. These settlers farmed and ranched here, raising cattle and sheep, and producing hay, potatoes, and oats. A number of early day ranching structures have been removed, but associated archeological resources may remain. Historic archeological sites also include fire pits of unknown origin and rock cairns built to stabilize fence posts. Culturally scarred trees dating to the late 1800s and early 1900s are described below.

As early as the mid-1800s amateur naturalists began to dig into the fossil-bearing shales, collecting what would become an extensive array of fossilized plant and

animal life. In 1873 scientists first began collecting fossils from the area and around 1920 the first tourist attraction associated with the fossils opened, the Coplen Petrified Forest. From that time until 1969 when the park was established, the public could view and dig for the fossils and petrified wood at one of two competing businesses in the valley.

Ethnographic Resources

Somewhere around A.D. 1450 Athapaskan-speaking peoples moved southward along the Rocky Mountains, continuing the basic economic patterns of hunting and gathering practiced by their predecessors. These groups were followed by the Comanche, Pawnee, and Plains Apache who claimed this area until about A.D. 1750. Over the next 75 years, Comanche and Ute tribes occupied the region, with the Comanche generally remaining east of the Rocky Mountains while the Ute claimed the mountainous areas, such as the fossil beds, as home territory. By the mid-1800s, the Cheyenne and Arapaho came to dominate the entire eastern half of the state (Mehls et al. 2000:10).

Some of the undated archeological sites likely reflect occupation by these historic groups. Contemporary American Indians feel a strong spiritual connection to sacred sites, springs, mountains, shrines and cemeteries, along with specific sites such as rock art sites, ceremonial areas across the West. No formal survey of ethnographic resources at the monument has occurred but the existence of archeological and historic sites within the monument indicates that such resources are present.

Seven culturally scarred trees (peeled cuts) have been positively identified within the monument. Analysis of cores indicates that the scars on three of the Ponderosa pine trees (trees aged 265, 234, and 282 years) were made in 1871, 1911 and 1907 respectively. Monument staff have mapped and sketched an additional 29 trees that await formal evaluation.

Ethnographers have documented that American Indians peeled away the outer bark of trees such as Ponderosa pine to find the soft inner bark that was eaten when food was scarce. Bark also was used as a tonic, as a building material, and for other objects such as baskets and cradleboards (NPS 1990:2). These scarred trees are most likely affiliated with the historic occupation of Florissant Fossil Beds by the Utes. Nine other trees have been identified by the Ute as Spirit Trees. Reportedly these trees were tied down as saplings so they would grow in a characteristic “L” shape.

Cultural Landscapes

The Hornbek Homestead has been identified as a potentially eligible cultural landscape (NPS n.d.a:24). Evidence of agricultural use of the Florissant valley

remains in the form of structures, such as barns and windmills, and earthworks, such as soil terraces and dams (NPS n.d.a:24). These structures and earthworks were evaluated for cultural significance by NPS Regional Chief of Cultural Resources Rodd Wheaton in 1993. Wheaton concluded that they held no significance.

Artifacts and Scientific Collections

The monument's world class collections include more than 6,133 natural resource and paleontological specimens, objects, and artifacts, along with supporting documentary literature, photographs, maps, and archival materials. Many of the collections and archival materials are housed outside the monument, but a number are stored in monument curatorial facilities.

National Register of Historic Places/List of Classified Structures

None of the monument's prehistoric resources are listed on the National Register of Historic Places. One large lithic site (5TL371) may be eligible but requires further evaluation.

The Hornbek house is listed on the National Register of Historic Places, and the house, root cellar, bunkhouse, carriage shed, and barn are listed on the monument's List of Classified Structures. The one-story, T-shaped Hornbek log home is significant as one of the most outstanding examples of domestic architecture in the Rocky Mountains. Built by the first homesteader of the Florissant Valley in 1878, and added onto in 1909, the structure has retained its integrity. To complete the historic scene, the homestead site has been repopulated with ranch buildings original to other homesteads in the monument area. The homestead is centrally located just west of the road that extends from the town of Florissant south into the monument.

Other buildings on the List of Classified Structures include the Maytag Ranch Barn and the Nelson Cabin. The barn is being adaptively used for maintenance operations. Historic structures being managed as monument cultural resources include the Halthausen cabin (Hornbek bunkhouse), the Wells (Hornbek) carriage shed, Del Johnson Cabin (Hornbek barn), and the Hornbek root cellar. The 1878 Hornbek House has been preserved to interpret the life of the early pioneers to monument visitors.

The Nelson vacation cabin was determined eligible for the National Register in 1995. The Nelson property consists of resources associated with two different eras and functions, one being an early twentieth century ranch homestead and the other a post-World War II vacation or "gentleman's" ranch. The vacation cabin, constructed in 1946, represents a cabin type common in ranching and vacation homes in the Rocky Mountains. The structure, situated on a hilltop

northeast of the Nelson main house in the far southwestern part of the monument, is significant as a fine example of a one-and one-half story Rustic style log building constructed on a native rock foundation. Most of the other buildings on the former Nelson Ranch, including the “White” house, outbuildings, outhouse, tack shed, log barn, cabin corral, root cellar, small barn, storage sheds, chicken coop, and barn corral were determined ineligible in 1985. The cabin is slated to be moved off of the monument in 2002-2003.

The visitor center and the Cusack potato barn were evaluated for the National Register in 1984 and determined ineligible for the Register.

Previous Investigations

Previous archeological investigations within Florissant Fossil Beds National Monument include early work by Etienne B. Renaud (1945). During the 1970s, additional surveys covered 80 percent of the monument (Olson et al. 1974), and two sites were tested (Olson and Bridge 1975). Jeffery L. Eighmy and Mark Guthrie developed prehistoric contexts for the Colorado plains and mountain areas in 1984 (Eighmy 1984; Guthrie 1984). Doug Scott of the National Park Service reported on the monument’s archeology in 1984, and a cultural sites inventory was begun for the monument in 1985 (NPS). Over the next few years, several small project-specific surveys were completed (NPS 1989, 1990, 1991, and 1999). Recent prehistoric contexts developed for the state of Colorado also are relevant to archeological sites along the Front Range and adjacent areas (Zier and Kalasz 1999; Gilmore et al. 1999).

Reports documenting historic resources within or adjacent to the monument include National Park Service studies (NPS n.d.a and n.d.c. by M. Culpin, and NPS 1994 and 1995), and a survey of the Gold Belt Scenic Byway, described by S. and C. Mehls (2000).

Regulations and Policies

The National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq.*), and the National Environmental Policy Act, as well as the National Park Service’s Director’s Order-28, *Cultural Resource Management Guideline* (NPS 1998b), *Management Policies* (NPS 2001f), and Director’s Order-12, *Conservation Planning, Environmental Impact Analysis and Decision-making* (NPS 2001a), require the consideration of impacts on cultural resources, including those listed on or eligible for listing on the National Register of Historic Places. The undertakings described in this environmental assessment are subject to Section 106 of the National Historic Preservation Act, under the terms of the 1995 Service-wide Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. This document will be

submitted to the Colorado State Historic Preservation Officer (SHPO) for review and comment.

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Under this alternative, the fuel load and the potential for wildfire would continue to increase in the future. Historic structures, ethnographic resources, and archeological resources, both above and below ground, could be placed at risk from wildfires and associated suppression activities. Sites and structures with flammable wooden elements, such as the monument's historic buildings and ethnographic resources, are especially vulnerable to fire.

At high temperatures, altering of artifacts by fire and heat is generally limited to the surface and the first few centimeters below the ground. An exception to this is where stumps and roots burn beneath the ground. Fires burning in vegetation adjacent to prehistoric sites, historic structures, culturally scarred trees, or Spirit Trees can continue to smolder underground, damaging subsurface elements as well. Temperatures as high as 1500 degrees Celsius (2732° F) may occur in areas where pitchy roots burn. Damage to archeological materials begins when temperatures approach 300 degrees Celsius (572° F), the temperature at which ponderosa pine begins to be killed.

With temperatures over 300 degrees Celsius (572° F), stone artifacts may spall, crack or break. Fires adjacent to structures and prehistoric sites with exposed stone of porous material can weaken and exfoliate the stone. Fire will burn pottery sherds, change their colors, and later destroy paints and glazes. A common effect is oxidation or carbonizing of sherds. In plainware pottery (common to Colorado's eastern Plains and front range), burning can make pottery type identification difficult.

Adverse impacts may result from human activities during fire suppression activities, including fire line and helispot construction, backfiring, and tree removal. Artifacts and archeological site features can be damaged and soils compressed by heavy equipment.

Fires also could damage or destroy irreplaceable artifacts and scientific specimens housed within the monument. Structures and sites located adjacent to but outside monument boundaries also could be at risk from wildfires. Most of the monument's cultural resources are nonrenewable, so adverse effects from such wildfires generally would be direct and long-term.

Fires can provide a positive benefit to archeologists by revealing sites previously obscured by vegetation, forest litter and duff. This allows a more complete survey and inventory of sites. However, it is also likely that runoff following a wildfire

would cause fairly rapid gully erosion, particularly in areas where trails are adjacent to a site. Erosion of denuded slopes can displace artifacts from their historic or prehistoric context, causing loss of site integrity. Uprooted trees and stumps from heavy runoff can destroy sites. Indirect impacts also could result from unauthorized collecting of newly exposed artifacts following a fire.

Archeological sites valued by American Indian tribes could be disturbed by fire or suppression activities such as excavation of fire lines. Of special concern are the culturally scarred trees and Spirit Trees that document historic American Indian use of the monument

Wildfires and fire suppression activities can selectively damage or remove character-defining elements of the monument's cultural landscapes, and leave behind unsightly burned and scorched vegetation, ruins of buildings, stumps, and unvegetated fire lines. Fire can degrade the qualities that make a landscape eligible for the National Register of Historic Places, and diminish aesthetic qualities of scenic viewsheds.

Most of the monument's cultural resources are nonrenewable, so adverse effects of fire on archeological and historic sites and resources generally would be direct and long-term. Some impacts on landscapes would, however, be short-term because selected vegetation could be replanted or could regenerate within two or three years.

The mitigation measures described in the "Alternatives" section of this assessment would be executed under the supervision of a qualified cultural resource specialist. However, some sites could not be protected during major fires, and professional expertise and many of the identified mitigation measures may be unavailable for some areas. Depending upon the intensity and scope of future wildfires and the extent to which mitigating measures could be implemented, direct and indirect adverse impacts on archeological, historical, ethnographic, and landscape resources would be minor to moderate, both short- and long-term.

Cumulative Effects. In the past, fires have been suppressed in areas surrounding the monument, and fuel loads continue to increase. Over time, a buildup of hazard fuels can contribute to cumulative losses of cultural resources from wildland fires over a broad area, both inside and outside the monument.

Regionally, cultural resources continue to be lost from encroaching urban sprawl (development of businesses, private homes, and highways), from erosion, and from collection of artifacts for sale or as a hobby. Modern developments, particularly those adjacent to monument boundaries, continue to encroach upon historic cultural landscapes. Many of Colorado's culturally altered trees are being lost to age, insects, decay, lightning, vandalism, timber harvest, and fire.

Cultural resources are nonrenewable so resource damage or loss from these combined causes would gradually diminish the types and numbers of resources available for scientific study or visitor enjoyment. When impacts of the no-action alternative are combined with these other past, present and foreseeable future activities and processes affecting cultural resources, moderate long-term adverse cumulative effects on archeological, historic, ethnographic, and landscape resources from wildfires, development, hobby collecting, and erosion would be anticipated. However, because of its limited acreage, the monument's contribution to the overall impacts on cultural resources would be modest, and, depending upon which areas of the monument are affected, impacts could vary from highly localized to monument-wide.

Conclusion. Depending upon the intensity and scope of future wildland fires, and on availability of mitigation measures and personnel, direct and indirect adverse impacts on prehistoric and historic archeological resources, historic structures, ethnographic resources, and cultural landscapes from wildfires and fire suppression activities would be minor to moderate, short- and long-term, and both direct and indirect.

Alternative A would not produce major adverse impacts on cultural resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of cultural resources or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Action

Analysis. The preferred action, combining hand-thinning and clearing of fuels, disposal of slash, and management-ignited prescribed fire, would help prevent or reduce adverse impacts of future wildland fires, resulting in a long-term, moderate beneficial effect.

Most of the area of potential effect has been inventoried and evaluated (see earlier discussion of previous investigations). Where areas of the monument have not been surveyed for cultural resources, unidentified resources in these areas could not be adequately protected from loss during fuel reduction or prescribed fire activities. Completion of archeological surveys of uninventoried areas and careful design of prescribed burns would help reduce accidental damage to cultural resources, and would allow application of protective measures such as fire shelters to fire-vulnerable sites and structures, thus reducing the potential for resource loss or damage.

During fuel reduction, cultural resources could be damaged by trampling of sites by work crews, felling and dragging wood over the ground surface, piling of slash on sites, and vehicles driving across sites. Damage to sites from tree cutting, removal, chipping, and disposal would be reduced by cutting the limbs and logs into transportable small pieces. This would avoid dragging the wood across sites, and disturbing artifacts or surface features. Use of existing roads to access work areas would help reduce vehicle damage to sites. Identification of suitable slash disposal areas (both on-site and off-site and away from cultural sites) would reduce the possibility of site damage. Additional mitigation measures itemized in Alternative B would help prevent or reduce impacts from these activities so direct adverse effects would be negligible to minor.

Fuel reduction, particularly along trails, could make surface artifacts and sites more visible and thus more vulnerable to unauthorized collection. To reduce these losses, work crews would be briefed about the need to protect cultural resources, and would be instructed regarding the illegality of collecting artifacts on Federal lands to avoid any potential ARPA (Archaeological Resources Protection Act) of 1979 as amended (16 USC 470aa-mm) violations.

Prescribed burns and fuel removal can leave exposed surface resources vulnerable to erosion, causing loss of artifacts and site integrity. Damage to sites would be reduced by careful design of prescribed burns and by archeological monitoring. Monitoring would include examination of ground exposed during fire management activities to identify previously unidentified cultural resources, such as shallow sites, and to identify areas requiring protective measures.

If unanticipated site discoveries were made, the archeologist would halt work in the area of the find, and protect the area until further investigation can be made. If necessary, mitigation would be developed in consultation with the Colorado State Historic Preservation Officer. These procedures and other mitigating measures described would help ensure that fire management activities would not damage or destroy cultural resources.

Culturally altered trees and other ethnographic resources could be adversely impacted, both short-and long-term, by thinning, limbing or prescribed fire. The National Park Service would work with tribes and with work crews to identify and protect ethnographic resources, and culturally altered trees and Spirit Trees would be avoided and protected during selective thinning and limbing. Adjacent non-cultural woody fuels would be removed to reduce the fire danger during prescribed burns or wildland fires. Thus any long-term adverse impacts on ethnographic resources would be negligible to minor.

Where thinning would affect one of the monument's potential cultural landscapes, implementation of the preferred alternative would include identification and protection of character-defining landscape elements. Protection of important scenic vistas also would be a priority. No vegetation would be removed that may

adversely impact the landscape. Thinning in and around the cultural landscapes would effect only modest changes in the types and amount of vegetation or other landscape features, a short-term minor adverse impact.

Prescribed burns can leave charred areas, and burned trees and stumps, creating a short-term visual impact on the potential landscapes. To avoid these impacts, fire lines around development areas would be created some distance outside of the visual perimeter of potential cultural landscapes, resulting in little or no effect on the cultural landscape(s) from prescribed burns. Over time, prescribed fires would benefit the monument's scenic viewshed in a minor way by helping to restore natural ecosystems (removing visually intrusive exotic species). In addition, reduction of fuels would benefit cultural landscapes by helping to protect important landscape elements from future wildfires.

Though mitigating measures applied before and during plan implementation, disturbance of cultural resources could be reduced or avoided, resulting in direct and indirect negligible to minor adverse impacts, both short- and long-term.

Cumulative Effects. As described for Alternative A, past and continuing urban development of residences, highways, and businesses, flood erosion, and collection of artifacts for profit or personal interest contribute to major reductions in the number and variety of archeological and historic resources in the region. Development of nearby private property continues to change the character of the monument's cultural landscapes. Some fires may still occur, causing resource loss. These losses cumulatively diminish the resources available for scientific study, the practice of traditional religious activities, and visitor enjoyment, resulting in long-term, moderate, adverse cumulative impacts.

When impacts of the preferred alternative, including protection of resources and reduction of fuel loads, are combined with these other past, present and foreseeable future activities and processes affecting cultural resources, minor, long-term, beneficial cumulative effects also would occur. Effects would be minor because of the relatively small land area affected under this alternative.

Conclusion. Reduction of fuels adjacent to and within sites and historic structures, including scheduled prescribed burns, would have a long-term, minor to moderate beneficial impact on cultural resources by making them much less vulnerable to future wildfires. Wildfires could still occur, but would tend to be less intense due to fuel reduction. With the above mitigating measures, only negligible to minor, direct and indirect short- and long-term adverse impacts to archeological, historic, ethnographic, and cultural landscape resources would be expected.

Alternative B would not produce major adverse impacts on cultural resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural

integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of cultural resources or values as a result of the implementation of Alternative B.

Section 106 Summary

The monument initiated Section 106 consultation with the Colorado State Historic Preservation Officer on December 13, 2001. Upon completion, this environmental assessment will be sent to the Colorado State Historic Preservation Office for review and comment in partial completion of Section 106 compliance for implementation of the fire management plan and the wildland-urban interface projects at Florissant Fossil Beds National Monument. Government-to-Government consultation with concerned American Indian tribes (see list of recipients in the "Consultation/Coordination" section of this EA) has been initiated to help ensure no adverse impacts occur to ethnographic resources during project implementation.

The environmental assessment provided detailed descriptions of two alternatives (including a no-action alternative), analyzed the potential impacts associated with possible implementation of each alternative, and described the rationale for choosing the preferred alternative. Also contained in the environmental assessment are mitigation measures that would help avoid adverse effects on cultural resources. For example, prior to implementation of fuels management activities, historical sites/structures and archeological sites would be flagged for avoidance. Work limits would be established so that fuels removal and prescribed fire activities, including potential ground disturbing activities, would be carefully planned in areas containing cultural sites. Slash disposal areas would be situated away from cultural sites.

Fuels would be removed from the vicinity of vulnerable sites, including culturally altered trees and Spirit Trees. This work would be accomplished under the direction of a resource professional. Note that reduction of fuels adjacent to historic properties would have long-term beneficial impacts on these resources by making them much less vulnerable to future wildland fires.

Most of the monument has been intensively surveyed for cultural resources. Pursuant to 36CFR800.5, implementing regulations of the National Historic Preservation Act (revised regulations effective January 2001), addressing the criteria of effect and adverse effect, the National Park Service finds that the implementation of the fire management plan and wildland-urban interface projects in Florissant Fossil Beds National Monument in these previously surveyed areas, with identified mitigation measures, would not result in adverse

effects to archeological, historic, ethnographic, or cultural landscape resources eligible for or listed on the National Register of Historic Places.

Prior to implementation of the proposed fire management activities in previously unsurveyed areas, an archeologist meeting the Secretary of the Interior's Standards would complete an inventory. The survey results (survey report), containing National Park Service determinations of eligibility for sites found in the project and potential slash disposal areas would be forwarded to the Colorado State Historic Preservation Officer for review and comment. The survey report also would include a description of the potential effects of the fire management projects on sites, and would reiterate proposed mitigation measures to prevent adverse impacts on historic properties.

All work would be performed in compliance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation and would be planned in consultation with the State Historic Preservation Officer. As appropriate, mitigation measures would be developed in consultation with the Colorado State Historic Preservation Officer and interested persons prior to implementation of the preferred alternative.

To reduce subsequent unauthorized collecting from areas where fuels have been removed, fire treatment personnel would be educated about cultural resources in general and the need to protect any cultural resources encountered. Work crews would be instructed regarding the illegality of collecting artifacts on federal lands to avoid any potential ARPA (Archeological Resources Preservatives Act) violations. This would include instructions for notifying appropriate personnel if human remains were discovered. In the unlikely event that cultural resources are discovered during treatment, work would be halted in the vicinity of the resource, and procedures outlined in 36 CFR 800 would be followed.

Whenever possible, the monument staff would continue to educate visitors regarding archeological site etiquette to provide long-term protection for surface artifacts and architectural features. Scheduling of fire management activities would be coordinated with interested American Indian groups. The National Park Service is committed to further consultation with affiliated tribes and with the Colorado State Historic Preservation Officer regarding both the cultural resource surveys and proposed mitigation measures. The monument would continue to work with American Indians to protect resources valued by the tribes.

PALEONTOLOGICAL RESOURCES

Affected Environment

Florissant Fossil Beds contains rich deposits of fossil plants, animals, and insects from the late Eocene Epoch, a period of time 34 to 35 million years ago. Volcanic mudflows buried the then lush valley and petrified the bases of the redwood trees that grew there. A lake formed in the valley and ash and pumice expelled from nearby volcanoes gradually washed into the lake, burying insects, leaves, fish, and other fragments of life. The fine-grained lake sediments compacted into layers of shale and preserved the delicate details of these organisms as fossils (NPS n.d.[brochure]).

Of the more than 50,000 fossil specimens collected in the monument, most are kept and studied at various museums and universities. Others are displayed in the monument visitor center. Two of the monument trails lead visitors to areas where they can view the massive petrified stumps of redwood trees, as well as see exposures of the fossil-bearing shale.

Insects are rarely preserved as fossils. However, due to the very fine nature of the volcanic ash that drifted into the ancient lake, thousands of insect fossils have been recovered at the monument. More than 1,400 species have been described.

Excavations in 1996 revealed a mammoth jaw fragment, dated at more than 42,000 years old, one of the oldest and highest elevation records for mammoths in North America. Deposits of Pleistocene gravel are extensive within the monument, suggesting the possibility of other similar discoveries (NPS 2001e).

Paleontological resources are exposed at 48 locations within the monument, and areas of the monument where fossil-bearing shales are concentrated are generally known. In some areas such as Scudder Quarry where fossil remains previously have been removed, the area continues to be important because it preserves an in-situ “archival” record of the stratigraphic position, fossil relationships, locale, and geologic context of excavated fossils. The National Park Service maintains an extensive database of publications on the monument’s fossil resources (Greg McDonald, August 2001, pers. comm.).

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Paleontological resources are direct evidence of past life and provide the basis for understanding the history of life on earth. They are non-renewable resources, many of which may deteriorate when exposed by erosion or other ground-disturbing activities.

Under this alternative, the fuel load and the potential for wildfire would continue to increase in the future. Paleontological resources, both exposed and subsurface, could be placed at risk from wildfires, especially from associated suppression activities such as creation of firelines, tree removal, operation of heavy equipment, and heliport construction. During a wildland fire, surfacial sites such as standing redwood stumps or exposed shales would be subjected directly to fire heat which can discolor, fracture, laminate, or score fossil specimens. The degree of permineralization damage would vary, depending upon the mineral content of the fossil and upon the surrounding geologic matrix. The degree of impact a wildland fire would have on buried fossils depends upon a number of factors, including the amount of leaf litter or duff and the depth of the soil horizon between the vegetation and the buried shales. Woody fuels are scarce on some exposed hillsides, so fire damage in these areas could be less than in other areas. Adverse effects on paleontological resources from such wildfires generally would be direct and long-term.

Indirect effects on fossils could also occur. The monument has numerous steep slopes that could be denuded of their vegetation cover by wildfire. Erosion following a fire could uncover fossil resources and displace them from their original location, destroying the spatial relationship between the fossil and the enclosing matrix. Exposed fossils may deteriorate or be destroyed by water and wind action. Fossils newly exposed after a fire would be more visible, and thus more vulnerable to unauthorized collecting.

In the event of a wildfire, post-fire resource surveys would be conducted to identify and evaluate newly discovered fossils and/or document damage to known fossil sites. A plan would be developed to ensure stabilization or information retrieval, and, during rehabilitation of fire control lines or burned areas, care would be taken to avoid damage to paleontological resources.

Any or all of these measures would be executed under the supervision of a qualified resource specialist. However, some fossil areas could not be protected during major fires, and professional expertise and many of the mitigation measures listed above may be unavailable for some sites. Depending upon the intensity and scope of future wildfires, the magnitude of suppression activities, and the extent to which mitigating measures could be implemented, direct and indirect adverse impacts on paleontological resources inside (and possibly outside) the monument would be minor to moderate, both short- and long-term.

Cumulative Effects. In the past, fires have been suppressed in areas surrounding the monument, allowing fuel loads to increase. Over time, a buildup of hazard fuels may result in wildland fires which can contribute to cumulative losses of paleontological resources, both inside and outside the monument, mostly from fire suppression activities.

Regionally, paleontological resources have been, and continue to be, lost due to their collection for profit or personal ownership. Rock quarrying and land development for new businesses, agriculture, private homes, and highways, along with associated erosion, continues to destroy paleontological specimens and deposits. Damage to or loss of these resources from varied causes combines to gradually diminish the types and numbers of resources available for scientific study or visitor enjoyment. When impacts of the no-action alternative are combined with these other past, present and foreseeable future activities and processes affecting fossil resources, moderate long-term adverse cumulative effects would be anticipated. However, because of its limited acreage, the monument's contribution to the overall impacts on paleontological resources would be modest, and, depending upon which areas of the monument are affected, impacts could vary from highly localized to area-wide.

Conclusion. Depending upon the intensity and scope of future wildfires, the magnitude of suppression activities, and the extent to which mitigating measures could be implemented, direct and indirect adverse impacts on paleontological resources inside (and possibly outside) the monument would be minor to moderate, both short- and long-term.

Alternative A would not produce major adverse impacts on paleontological resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of paleontological resources or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. The preferred action, combining thinning and clearing of fuels, piling and burning of the thinned slash, chipping and scattering of the slash, hauling slash offsite, and management-ignited prescribed fire, would reduce the volume of woody vegetation, restore the natural vitality of ecosystems and remove or reduce exotic species. The methods used for each treatment unit would be determined by site-specific conditions and management goals.

Many of the impacts described above for wildland fire could also occur during prescribed fire; e.g. surface fossils could be discolored, cracked, or exfoliated from fire heat. Buried fossils could be damaged by fire burning into tree roots, and by fire management activities such as brush clearing or construction of fire lines.

The monument's paleontologically rich areas have been identified and mapped. To mitigate potential impacts, work-limits would be defined in the vicinity of

paleontological resources, and prescribed burn treatment areas would be carefully designed to avoid resources. Vehicles would be directed to access work areas via non-sensitive routes. Felling and dragging wood over the ground surface could damage shallow or exposed resources, so all potential ground-disturbing activities would be avoided in areas containing fossil resources. Prescribed fire would not be used in areas where dam removal projects are ongoing.

Prior to prescribed burns, the monument's paleontologist/natural resource specialist would identify any sites where fire should be avoided. The resource specialist would monitor fire management activities and would help identify suitable slash disposal areas. Ground surfaces exposed during fire management activities would be examined to identify previously unidentified resources, and to document condition of known fossil deposits.

Additional mitigation strategies to be considered include the removal of fuels within paleontological sites. Such actions should be accomplished under the direction of a resource professional. No mechanized equipment would be used within sensitive areas (as defined by the monument staff). This would eliminate most potential direct impacts to fossil resources.

Fuel reduction and prescribed burns, particularly along trails and roads, could make fossils more visible and thus more vulnerable to unauthorized collection by work crews and visitors. To reduce resource loss, work crews would be briefed about the need to protect any fossils encountered, and the monument would continue to educate visitors about the need to protect resources.

Though mitigating measures, disturbance of paleontological resources could be avoided during implementation of the fire management plan. Reduction of fuels, including scheduled prescribed burns, would have a long-term, minor to moderate beneficial impact on fossil resources by making them much less vulnerable to future wildfires and fire suppression activities. Wildfires could still occur, but would tend to be less frequent and less intense due to fuel reduction. With the above mitigating measures, only negligible to minor short- and long-term adverse impacts to fossil resources would be expected, and these impacts would generally be limited to previously unidentified resources.

Cumulative Effects. As described for Alternative A, past and continuing development of residences and businesses, highways, flood erosion, quarrying, and collection of specimens for profit or personal interest contribute to major reductions in the number and variety of fossil resources. In the past, fires have been suppressed in areas surrounding the monument, allowing fuel loads to increase. Some fires may still occur, contributing to resource loss.

These losses cumulatively diminish the resources available for scientific study and visitor enjoyment, resulting in long-term, moderate, adverse cumulative

impacts. Implementation of the preferred alternative would reduce the potential for wildfires, slowing loss of fossils and resulting in minor, long-term, beneficial effects within the monument. However, when impacts of the preferred alternative are combined with other past, present and foreseeable future activities and processes affecting fossil resources regionally, minor to moderate long-term adverse cumulative effects would be anticipated. That is, because of the limited land area affected (579 acres over the next five years), the monument's contribution to the overall cumulative impacts on paleontological resources regionally would be very modest.

Conclusion. Reduction of fuels, including scheduled prescribed burns, would have a long-term, minor to moderate beneficial impact on fossil resources by making them much less vulnerable to future wildfires and fire suppression activities. Wildfires could still occur, but would tend to be less frequent and less intense due to fuel reduction. With the above mitigating measures, only negligible to minor short- and long-term adverse impacts to fossil resources would be expected, and these impacts would generally be limited to previously unidentified resources.

Alternative B would not produce major adverse impacts on paleontological resources or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of cultural resources or values as a result of the implementation of Alternative B.

ECONOMIC EFFECTS

Affected Environment

Florissant Fossil Bed National Monument is located in Teller County. Approximately six towns and communities are located here, with the remainder of the county made up of rural subdivisions and unplatted parcels. Forty-nine percent of the county is public land (Teller County 2001). Cripple Creek and Victor, locally well-known mining towns, were established during the Rocky Mountain gold rush era and lie several miles to the south of the monument (Teller County 2001). The town of Florissant, at the north end of the monument, is a very small community, with one main intersection and several dozen residents.

The economy of the area has traditionally been centered on ranching, mining, and timber harvest - the remains of which are still visible today. Mining and ranching activities continued today, although their economic importance has declined. Today, tourism, gambling, and ex-urban expansion provide economic

support for the county. The monument plays an important role in providing open space and access to unique resources in this changing environment.

Teller County enjoys a higher than average annual household income. The Census Bureau estimates the average Teller County income to be \$45,552, as compared to the Colorado annual average of \$40,853 (Census Bureau 2000). This may be reflected in the current development patterns and suburban expansion adjacent to the monument boundaries. The homes and properties constructed adjacent to and in the vicinity range from single holdings of hundreds of acres to lot-sized developments (T. Ulrich, pers. comm.).

Fire management and control within the monument has the ability to significantly affect adjoining and nearby properties. Wildfire in the area could significantly affect residents and economic activities in these communities. The fuel load generated by fire exclusion and land use practices now poses an increased potential for high-intensity wildfire, especially in the ponderosa pine communities (NPS 2001d).

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Without intervention, fuels will continue to accumulate within the monument and the boundary areas. This buildup could yield adverse effects that would include periodic disruption of area economic activities resulting from wildfire. This would include loss of recreation and tourism revenue and potential loss of personal property. Depending on the location and extent of the wildfire, the intensity of these short-term, adverse effects could range from negligible to moderate.

The potential for large-scale firefighting activities is not reduced under Alternative A. The costs of fighting wildfire could be great, and may include loss of property and life. The presence of high fuel loads, long fire recurrence interval, and decades of fire suppression, places the area at high risk of wildfire, which is not reduced under current management practices.

Cumulative Effects. Alternative A does not provide for specific fuels reduction along the monument's urban interface. As a result, there would be a long-term effect on the economy associated with the potential for the spread of wildfire. In addition, fuels management on adjacent property is not fully known, and may not provide consistent, adequate protection for adjoining lands. The result could be a minor to moderate, short-term, cumulative adverse effect on the economy in the event of wildfire.

Conclusion. Short and long-term, local and regional, adverse effects would be those associated with exposure to migrating wildfire. These effects would include

the cost of suppression and loss of property, which could range from negligible to moderate, depending on the location and severity of the fire.

Impacts of Alternative B, the Preferred Alternative

Analysis. Implementation actions of Alternative B would have no direct effects on the local economy. Benefits would be indirect and associated with reduced potential for wildfire. Threats to public and private property posed by increased fuel loads would be reduced, and a safer environment would be created, both of which would be beneficial, economically. Limiting the spread of wildfire and creating defensible boundaries creates long-term benefits that are local and regional. Avoiding wildfire damage and the resultant costs of firefighting would protect the economic resources of the area. This would produce beneficial, indirect, and negligible to moderate, long-term effects on the local economy.

Cumulative Effects. The nearby Pike National Forest is pursuing fuel load reduction strategies in the area. Their efforts, in concert with the proposed action at Florissant Fossil Beds National Monument would serve to protect local economic resources from the effects of wildfire and large-scale fire suppression. These benefits are long-term, negligible to moderate, and local to regional in scale.

Conclusion. The monument and local area would experience long-term, negligible to moderate, indirect, beneficial economic effects as a result of implementation of Alternative B.

MONUMENT OPERATIONS

Affected Environment

The superintendent at Florissant Fossil Beds National Monument is responsible for the full scope of managing the monument, its staff and residents, all of its programs, and its relations with persons, agencies, and organizations interested in the monument.

Monument staff provide the full scope of functions and activities to accomplish management objectives and meet requirements in law enforcement, emergency services, public health and safety, science, resource protection and management, visitor services, interpretation and education, community services, utilities, housing, fee collection, and management support.

Impacts of Alternative A, Continue Current Management/No Action

Analysis. Under Alternative A, the increased likelihood of a wildfire migrating across monument boundaries would have a negligible to moderate, direct, short-term, adverse impact on monument operations, assuming that a wildfire would occur. In such an event, the monument's total suppression management strategy requires a large commitment of staff and resources to manage, coordinate, and fight the wildfire.

Cumulative Effects. Alternative A would have a minor to moderate, adverse cumulative impact on management projects occurring in the monument. These projects include weed eradication, and the removal of earthen dams throughout the monument.

Conclusion. The effects of the no action alternative on monument operations would predominantly result from a wildfire occurring within or migrating into the monument. The coincident effects on monument operations would be direct, local, short-term, adverse, and minor to moderate.

Impacts of Alternative B, the Preferred Alternative

Analysis. In addition to the actual implementation of Alternative B, this action would also include monitoring weather conditions and notifying monument neighbors of when and where prescribed burning would take place. Adverse effects to monument operations would be negligible and short-term and would not add considerably to the workload of monument staff.

If the monument contracts services commensurate to the implementation of Alternative B, there would be negligible, short-term adverse effects as a result, and monument staff would be available to perform their regular duties. Other than activities such as plan writing and monitoring of services, there would not be any treatment-related effects on other monument operations or the allocation of resources and staff.

The preferred alternative would reduce fuel loads throughout the monument and its border. This defensible space would be advantageous to firefighting efforts. This would represent a moderate, long-term, beneficial effect to the monument staff.

Cumulative Effects. Monument operations would experience a long-term, moderately beneficial effect as a result of the implementation of the preferred alternative, in combination with the fuel reduction projects that are in progress and planned in the Pike National Forest. The ultimate effect of these projects and plans would reduce the likelihood of a wildfire, which in turn would reduce the

potential for the disruption of monument operations that would accompany a wildfire.

Conclusion. Alternative B would result in negligible, short-term, localized, adverse effects to monument operations from treatment implementation. Long-term effects to monument operations would be moderately beneficial and result from reduced potential for wildfire.

PUBLIC HEALTH AND SAFETY

Affected Environment

Several groups would potentially be affected by the proposed action. Private landowners surround the entire monument, and monument staff and visitors may also be affected.

Impacts of Alternative A, Continue Current Management/No Action

Analysis. This alternative relies on full suppression actions to insure the safety of the public, monument personnel, and firefighters. The impacts are directly related to the severity of the fire and its location. A severe fire has greater potential to impact the safety of the public, monument personnel, and firefighters. If Alternative A is implemented, fuel loads would continue to accumulate and the risk of exposure to wildfire would increase. Extreme effects to public health and safety from wildfire include loss of life and property, injury, and health effects caused by exposure to smoke emissions. Current fire management actions would have a minor to moderate, short- and long-term, adverse effect on public health and safety.

Cumulative Effects. Alternative A would not support other projects and plans outside of the monument whose goal is to manage fire, including the efforts in Pike National Forest. Failing to support such plans reduces the overall effectiveness of area-wide fire management and results in long-term, minor to moderate, cumulative, adverse effects.

Conclusion. Alternative A would have an adverse, short- and long-term, minor to moderate effect on public health and safety in the event of a wildfire.

Impacts of Alternative B, the Preferred Alternative

Analysis. Safety of the public and monument personnel is the number one priority of the Florissant Fossil Beds National Monument fire management program. Federal Wildland Fire Management Policy as implemented through National Park Service Director's Order - 18 reinforces that concept. Aggressive

thinning within the Interface Fire Management Unit would provide a fire defense boundary at the monument boundary. The reduced potential for fire to enter the monument at this boundary would represent a minor to moderate, short- to long-term, beneficial effect of Alternative B.

Slash-pile burning would result in localized impacts to workers and visitors in the immediate vicinity. The use of mitigation measures as described in the “Alternatives” section would reduce the level of impacts to public health and safety to short-term and negligible.

Under this alternative, prescribed fire would be used to further reduce hazardous fuels and to restore ecosystem processes. Implementing a prescribed burn, fire managers must consider the safety as well as the results of the prescribed fire. Due to the controlled nature of a prescribed burn, as confirmed through the use of an approved prescribed fire plan, risks to public health and safety would be minimized. Fuels in the forested areas targeted for prescribed burning would be mechanically thinned to reduce the risk of escaped fire. Monument staff would use Fire Family Plus software to analyze historic weather data and interface with the National Weather Service to determine when conditions are ideal for prescribed burning that would allow the monument to achieve the goals of a burn without danger of its escaping. To further reduce the chance of escaped fire and to protect public health and safety, prescribed fire unit boundaries would utilize the natural features, natural fuel breaks, and existing roads and trails for perimeter controls. With careful planning and execution of prescribed fires, adverse effects to public health and safety resulting from prescribed burning would be short-term, local, and negligible.

In the long-term there is an expectation that the severity of wildland fires would decrease as more of the monument’s hazard fuels are treated with prescribed fire and mechanical fuel reduction projects. A decrease in fire severity reduces fire containment times, thereby reducing the total area impacted by that wildland fire event. A reduction in the severity of a fire and the associated effort needed to stop its spread would reduce the amount of time that the public, monument personnel and firefighters are exposed to the wildland fire situation, presumably resulting in moderate long-term, beneficial, local and regional effects to public health and safety.

Cumulative Effects. Educational efforts by the interagency fire management cooperative aimed at nearby private landowners would encourage private landowners to maintain defensible spaces around their homes and properties. Successful education, implementation of fire protection measures, and cooperation with regional firefighting organizations, in conjunction with the management strategies proposed in the fire management plan, would have a moderate, regional, beneficial cumulative effect by decreasing the potential for wildfire ignition and spread, thus protecting public health and safety.

Conclusion. Effects to public health resulting from smoke emissions associated with prescribed burning and slash-pile burning would be short-term, local, adverse, and negligible. Long-term effects, associated with a reduced potential for wildfire to escalate or migrate outside the monument, would be beneficial and minor to moderate.

VISITOR USE AND EXPERIENCE

Affected Environment

In the year 2000, Florissant Fossil Beds National Monument hosted 82,094 visitors, 57 percent of which visited during the period June through August. The number of visitors during spring and fall months was approximately one-third of the number visiting during summer months. Less than 10 percent of the visits occurred during the winter period of November through February. The average visitor length of stay at the monument is 1.2 hours, and the primary visitor activity is touring the visitor center and the portion of the project area associated with the petrified Sequoia stumps. There are fifteen miles of gravel hiking trails, including two miles of self-guided trails (NPS 2001b)

Impacts of Alternative A, Continue Current Management/ No Action

Analysis. The high fuel load resulting from the buildup of plant debris generates a higher probability of a wildfire. The continuation of current conditions could lead to a wildfire that would have direct, short-term adverse impacts. Depending on the magnitude of the wildfire, adverse impacts would be negligible to moderate, potentially closing the monument or portions of the monument, disrupting tourist use and activities. Monument staff normally devoted to customer relations would have their responsibilities diverted to firefighting. Long-term, minor adverse effects would include the change of scenery and loss of recreational opportunities in the aftermath of wildfires.

Cumulative Effects. With the number of existing residential and commercial developments on the monument's periphery, there is increased potential for wildfires to cross the monument boundary from private property. Existing high fuel levels within the monument would magnify the impact of fire coming into the monument from outside, potentially closing portions of the monument to visitor use and would have a potential minor to moderate, short-term adverse effect on visitor experience.

Conclusion. The potential for wildfire would remain high due to a build-up of hazardous fuels within the monument. No action would have an adverse, direct, short-term effect on the visitor experience, potentially limiting or restricting access to the monument and/or closing portions of the monument to visitor use

due to smoke and concerns for visitor safety. The effect would be negligible to minor, if localized, however; a wildfire impacting a larger area would have moderate, long-term effect, causing monument closure and reducing visitation by altering the public's perception of this monument.

Alternative A would not produce major adverse impacts on visitor use and experience or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of visitor use and experience or values as a result of the implementation of Alternative A.

Impacts of Alternative B, the Preferred Alternative

Analysis. Removal of standing dead timber would have a direct, long-term beneficial impact on the visitor experience. Fuel reduction would lessen the chance of visitors being subjected to adverse impacts of a wildfire that could potentially close the monument or char the landscape, altering the quality of the experience. Fuel reduction activities would cause short-term public use restrictions resulting in negligible to minor effects on visitor use and experience.

Because slash-piles would impact relatively small sites within the treatment areas, there would be short-term, negligible to minor, adverse impacts on the visitor experience. Slash piles would be hauled from the visitor center and other visitor use areas and burned offsite to avoid both direct and localized adverse impacts to areas that receive large numbers of visitors. Slash piles in treatment areas near major access roads would be burned when climatic conditions are appropriate to ensure that smoke would not interfere or detract from the visitor experience. Burning slash piles in areas rarely frequented by visitors would have a short-term, negligible, adverse impact on the visitor experience.

Prescribed burns in treatment areas adjacent to access roads would have a direct, negligible to minor, adverse effect on the tourist experience, depending on the size of the burn and climatic conditions. Smoke resulting from prescribed burns in areas of the monument not frequently used by visitors may produce indirect negligible to minor adverse impacts on the visitor experience by affecting the viewshed. In general, prescribed burn effects would be localized, have short-term, adverse impacts and provide the long-term beneficial effect of reducing the chance for wildfires that would cause a substantial disruption to visitor use and experience. Educational materials and interpretive programs would explain the need and benefits of these two types of burn strategies.

Cumulative Effects. Implementation of Alternative B, in combination with other fire management plans and projects in the surrounding area and in combination

with fuel management projects being implemented in Pike National Forest would result in long-term minor to moderate, beneficial cumulative effects on visitor use as a result of the reduced potential for wildfire.

Conclusion. Reduction in the amount of hazardous fuels would have a direct, long-term, beneficial effect on the visitor experience. Fuel reduction would lessen the chance of visitors being subjected to adverse impacts of a wildfire that could potentially close the monument or char the landscape, altering the quality of the experience. Although the effects would be localized, there would be minor to moderate, beneficial impacts on the visitor experience due the reduced potential for wildfire and an improved landscape scene. Negligible to minor short-term adverse effects to visitor experience and use would occur from public access restrictions during management and prescribed burning activities.

Alternative B would not produce major adverse impacts on visitor use and experience or values whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of the monument, (2) key to the natural or cultural integrity of the monument or opportunities for enjoyment of the monument, or (3) identified as a goal in the monument's general management plan or other National Park Service planning documents. Consequently, there would be no impairment of visitor use and experience or values as a result of the implementation of Alternative B.

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CONSULTATION/COORDINATION

AGENCIES/TRIBES/ORGANIZATIONS/INDIVIDUALS CONTACTED

Tribes. The Northern Ute Tribe has demonstrated interests in the areas of Florissant Fossil Beds National Monument that are covered by this environmental assessment. In accordance with the National Historic Preservation Act (revised regulations effective January 2001), letters requesting tribal consultation were mailed to the above noted tribe by NPS staff. No reply has been received to date.

State Historic Preservation Office. Correspondence with the Colorado State Historic Preservation Office regarding this project occurred on December 13, 2001. Upon completion, this environmental assessment will be sent to the Colorado State Historic Preservation Office for review and comment in partial completion of Section 106 compliance for implementation of the fire management plan and the wildland-urban interface projects at Florissant Fossil Beds National Monument.

U.S. Fish and Wildlife Service. Park staff contacted the U.S. Fish and Wildlife Service by phone. Through this consultation, it was determined that no threatened, endangered, species of concern or critical habitat occur in the monument (P. Plage USFWS, pers. comm.). No further consultation with U. S. Fish and Wildlife Service is required.

List of Preparers

Name	Role on project	Title	Office
National Park Service			
Tom Ulrich	Planning and design	Chief Ranger	Florissant Fossil Beds National Monument
Jesse Duhnkrack	Planning and design	Fire Management Officer	Rocky Mountain National Park
Pat Stephen	Planning and design	Prescribed Fire Technician	Rocky Mountain National Park
Nathan Williamson	Planning and design	Fire Ecologist	Rocky Mountain National Park

Name	Role on project	Title	Office
Parsons			
Belish, Timberley	Project management, contributing author	Senior Scientist	Denver
Bryant, Jacklyn	Contributing Author	Senior Scientist	Denver
Kellett, Don	Project Manager	Environmental Scientist	Denver
Norman, Mark	Contributing Author	Environmental Scientist	Denver
Rhodes, Diane	Contributing Author	Cultural Resource Specialist/Archeologist	Denver
White-Scott, Nicole	Editor	Environmental Scientist	Denver

List of Recipients

The following agencies, tribes and organizations have been sent a copy of this environmental assessment. Landowners adjacent to the monument and other interested parties have been sent notification of the documents availability with information on how to obtain copies.

Federal Agencies

U.S. Department of Agriculture Farm Service Agency
U. S. Forest Service Pike National Forest

State Agencies

Colorado Department of Natural Resources
Colorado Division of Wildlife
Colorado State Historic Preservation Office

Local Agencies

Teller County Commissioner
Florissant Fire Department
Four Mile Fire Department
Teller County Sheriffs Department

Tribes

Unitah and Ouray Tribe

Elected Officials

Senator Ben Nighthorse Campbell
Senator Wayne Allard

Organizations

Upper South Platte Watershed Protection Association

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APPENDIX A: LETTERS AND OTHER COORDINATION DOCUMENTATION

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June 18, 2001

Dear Interested Party:

Florissant Fossil Beds National Monument is proposing to implement a series of hazard fuel reduction projects that will support our goals for reducing wildfire risk and restoring natural ecosystem processes. The cumulative effects of fire suppression and present and past land management practices have resulted in plant communities with a higher than normal amount of combustible fuels. These fuels present a risk to structures and human activities that occur both within the park and in the communities and subdivisions along our boundaries.

In 1994, a fire history study for the monument was conducted, and found that the historic pattern of return fire intervals had been interrupted by settlement, and that fuels densities had been increasing as a result. In May of this year, an assessment was made of fuel accumulation along the boundary of the eastern half of the monument, where the prevailing winds, slopes, and development density present the most significant wildfire risk. This summer, a draft plan to reduce these fuels and others in the monument and to begin to restore fire as an ecosystem process will be completed.

During the winter of 2000-01, federal wildland fire management policy was reviewed. The review provided more clear direction to federal agencies that protection of human life is an overriding principle. Wildland fire will be used to protect, maintain and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role. Planning must provide for firefighter and public safety, address important values to be protected, be consistent with resource management objectives and comply with environmental laws and regulations.

The fuel and fire management plan proposes to first reduce hazard fuels through thinning of fuels adjacent to monument boundaries and to structures in the monument. Treatment projects proposed include cutting and scattering fuels in sparser areas, and cutting, piling and burning fuels in denser areas. Subsequent to these mechanical treatment projects near developed areas and along the boundaries, a series of burn treatments are proposed. These treatments would be planned to burn accumulated surface fuels, while preserving a large

percentage of the mature forest canopy. All wildfires would continue to be immediately suppressed.

To evaluate alternatives and determine environmental consequences, we will be preparing an environmental assessment for these plans. Monument Superintendent Jean H. Rodeck would like to hear about your concerns regarding proposed implementation of the plan to manage hazard fuels and wildfire. The monument welcomes your input in understanding issues and developing alternatives for resolving these management issues. Issues identified to date include effects on health and safety, water quality, air quality, soils, vegetation, wildlife, paleontological resources, cultural resources, and visitor experience. Please send your scoping comments to: Superintendent, Florissant Fossil Beds National Monument, P.O. Box 185, Florissant CO 80816 or via e-mail to: flfo_superintendent@nps.gov.

Please submit your comments by July 19, 2001. Please note that names and addresses of people who comment become part of the public record. If you wish us to withhold your name and or address, you must state this prominently at the beginning of your comments. We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

Sincerely,

Jean H. Rodeck
Superintendent



LY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Florissant Fossil Beds National Monument
P.O. Box 185
Florissant, Colorado 80816

H4217 (FLFO)
Y1421(FLFO)

January 6, 2002

Mr. D. Floyd Wopsock, Chairman
Uintah and Ouray Tribal Business Committee
P.O. Box 190
Fort Duchesne, UT 84026

Reference: Section 106 Consultation, Wildland-Urban Interface Projects at Florissant
Fossil Beds National Monument

Dear Mr. Wopsock:

Florissant Fossil Beds National Monument is preparing an environmental assessment (EA) to evaluate potential impacts to the natural and human environment from projects associated with a fire/fuel management plan. The planning alternatives identified in the EA include suppression of all wildland fires and fuel management treatment methods such as mechanical thinning of fuels and prescribed fire. The purpose of the fire/fuel management plan is to protect human life and property within and adjacent to National Park Service lands. The plan is also intended to re-establish fire as an ecosystem process within the Monument. Implementation of the plan is expected to begin in the summer of 2002.

As outlined in 36 CFR 800.3, we are initiating consultation with your tribe to help ensure that the proposed project will not negatively impact ethnographic resources with a cultural affinity to tribal members. Ethnographic resources are defined by the National Park Service (NPS) as: any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.

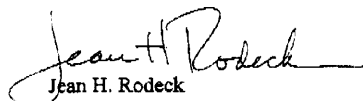
The project will be fully described in an Environmental Assessment, which will be forwarded to you for review as soon as it is completed. Please examine the enclosed map of the proposed work. One resource that is of concern to us is the Culturally Scarred Trees. The Environmental Assessment proposes mitigation measures that would protect

these trees from any fuels treatment projects by excluding fire from the area around them and identifying them for avoidance by mechanical treatment crews. If you feel there are resources that may be impacted by the project, please contact me at 719-748-3253. We would appreciate hearing about any concerns you may have by February 15, 2002.

I would like to take this opportunity to ask also if you have concerns about how the Ute history in the Florissant area is interpreted to the visiting public by National Monument staff. As you are undoubtedly aware, the Florissant Heritage Foundation has been very active in interpreting this history, including the Culturally Scarred Trees, and have consulted with Ute tribal representatives regarding signing, interpretive talks, etc.. Because of the unique and more formal sovereign to sovereign relationship that the Federal Government has with the tribes, however, I have been instructing my staff to refrain from any similar interpretive efforts until your approval has been specifically granted. Are you pleased with the efforts of the Florissant Heritage Foundation? If so, should the National Monument make use of the consulting effort that they have already undertaken with you? Or, alternately, is there a person with whom you would like to have us consult prior to any attempts to interpret the Ute history in the area?

Please let me know, as we most certainly do not want to proceed with any interpretation unless you approve.

Sincerely,


Jean H. Rodeck
Superintendent

**APPENDIX B: FLORISSANT FOSSIL BEDS
NATIONAL MONUMENT FIVE-YEAR FUELS
MANAGEMENT PLAN**

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Florissant Fossil Beds National Monument Five-Year Fuels Management Plan

2002-Year Treatment

Mechanical Treatment:

Acres: Mechanically treat approximately 50 acres along the east central boundary of the monument. This consists of almost 2 miles of boundary at a depth of up to 330 feet. In addition, 20 acres around developments within the monument are to be treated.

Vegetation: Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur primarily on the south and west aspects and ridgetops. A considerable amount common juniper is found in this area. Some fir and spruce occur with pine on north aspects. Occasional stands of aspen are present.

Goals: Treat fuels to reduce fire behavior, in particular, crown fire potential, that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire modeling programs.

2003-Year Treatment

Mechanical Treatment:

Burn piles generated from mechanical treatment in FY02.

Acres: Mechanically treat approximately 70 acres along the north boundary of the monument. This consists of almost 4 ½ miles with a depth up to 330 feet.

Vegetation: Almost 17 percent of this area consists of meadow/grass/forbs community that will require no treatment. Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur primarily on the east, west and south aspects as well as ridgetops. Some fir and spruce is interspersed with pine, particularly in drainages and north aspects. Occasional stands of aspen are present.

Goals: Treat fuels to reduce fire behavior, in particular, crown fire potential, that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire behavior modeling programs.

Prescribed Fire Treatment:

Acres: 64

Vegetation: Meadow/grass/forbs community with pine encroachment adjacent to ponderosa pine stand.

Goals: Expand meadow/grass/forbs community; reduce pine and shrub in the burned area. Increase native species. Serve as a familiarization, education and training burn for the park and its neighbors.

2004-Year Treatment

Mechanical Treatment:

Burn piles generated from mechanical treatment in FY03.

Acres: Mechanically treat approximately 25 acres along the southeast boundary of the monument. The depth of treatment will extend up to 330 feet inside the boundary. The total distance of this area is just over 2 ½ miles, only a portion will be treated during this year.

Vegetation: Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur primarily on the east, west and south aspects as well as ridgetops. Some fir and spruce is interspersed with pine, particularly in east aspects. Slopes with a north aspect consist of relatively dense stands of spruce and/or fir in addition to aspen. Common juniper is prevalent and would be a significant contributor to extreme fire behavior.

Goals: Treat fuels to reduce fire behavior, in particular, crown fire potential, that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire behavior modeling programs.

Prescribed Fire Treatment:

Acres: Approximately 100 acres adjacent to the previously treated areas along the north and northeast boundaries of the park.

Vegetation: Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur primarily on the south and west aspects and ridgetops. A considerable amount of common juniper is found in this area. Some fir and spruce is interspersed with

pine, particularly in drainages and north aspects. Occasional stands of aspen are present. Meadow/grass/forbs community with pine encroachment adjacent to ponderosa pine stands.

Goals: Use prescribed fire in and adjacent to mechanical treatment areas to further reduce hazardous fuels. This treatment will reinforce the boundary treatments, thus reducing the potential for extreme fire behavior that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire behavior modeling programs. In addition, prescribed fire treatments would help reduce the pine encroachment into the meadows and density of the pine and pine-fir forest.

2005-Year Treatment

Mechanical Treatment:

Burn piles generated from mechanical treatment in FY04.

Acres: Mechanically treat approximately 25 acres along the southeast boundary of the monument. The depth of treatment will extend up to 330 feet inside the boundary. The total distance of this area is just over 2 ½ miles, only a portion will be treated during this year.

Vegetation: Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur primarily on the east, west and south aspects as well as ridgetops. Some fir and spruce is interspersed with pine, particularly in east aspects. Slopes with a north aspect consist of relatively dense stands of spruce and/or fir in addition to aspen. Common juniper is prevalent and would be a significant contributor to extreme fire behavior.

Goals: Treat fuels to reduce fire behavior, in particular, crown fire potential, that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire behavior modeling programs.

Prescribed Fire Treatment:

Acres: Approximately 100 acres adjacent to the previously treated areas along the north and northeast boundaries of the park.

Vegetation: Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur primarily on the south and west aspects and ridgetops. A considerable amount

common juniper is found in this area. Some fir and spruce is interspersed with pine, particularly in drainages and north aspects. Occasional stands of aspen are present. Meadow/grass/forbs community with pine encroachment adjacent to ponderosa pine stands.

Goals: Use prescribed fire in and adjacent to mechanical treatment areas to further reduce hazardous fuels. This treatment will reinforce the boundary treatments, thus reducing the potential for extreme fire behavior that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire behavior modeling programs. In addition, prescribed fire treatments would help reduce the pine encroachment into the meadows and density of the pine and pine-fir forest.

2006-Year Treatment

Mechanical Treatment:

Burn piles generated from mechanical treatment in FY05.

Acres: Mechanically treat approximately 25 acres along the southeast boundary of the monument. The depth of treatment will extend up to 330 feet inside the boundary. The total distance of this area is just over 2 ½ miles, only a portion will be treated during this year.

Vegetation: Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur primarily on the east, west and south aspects as well as ridgetops. Some fir and spruce is interspersed with pine, particularly in east aspects. Slopes with a north aspect consist of relatively dense stands of spruce and/or fir in addition to aspen. Common juniper is prevalent and would be a significant contributor to extreme fire behavior.

Goals: Treat fuels to reduce fire behavior, in particular, crown fire potential, that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire behavior modeling programs.

Prescribed Fire Treatment:

Acres: Approximately 100 acres adjacent to the previously treated areas along the north and northeast boundaries of the park.

Vegetation: Ponderosa stands range from very open with a grass understory to more closed stands with continuous needlecast. These pine stands occur

primarily on the south and west aspects and ridgetops. A considerable amount common juniper is found in this area. Some fir and spruce is interspersed with pine, particularly in drainages and north aspects. Occasional stands of aspen are present. Meadow/grass/forbs community with pine encroachment adjacent to ponderosa pine stands.

Goals: Use prescribed fire in and adjacent to mechanical treatment areas to further reduce hazardous fuels. This treatment will reinforce the boundary treatments, thus reducing the potential for extreme fire behavior that would threaten private property adjacent to the boundary. Prescription parameters will be determined using stand data and fire behavior modeling programs. In addition, prescribed fire treatments would help reduce the pine encroachment into the meadows and density of the pine and pine-fir forest.

Objectives

Prescribed Fire Objectives

Open Canopy Ponderosa Pine:

1. Reduce total fuel load, including all woody material, litter, and duff, by 40 to 80 percent, immediate post-burn
2. Limit overstory ponderosa pine mortality to 5 percent within 5 years post-burn
3. Generate 20 to 70 percent mortality in pole-sized trees within 5 years post-burn
4. Increase diversity, percent cover, and/or density of native grass and native forb species by at least 15 percent within 5 years post-burn; reduce the percent cover of any non-native plant species by at least 15 percent within 5 years post-burn

Closed Canopy Ponderosa Pine:

1. Reduce total fuel load, including all woody material, litter, and duff, by 40 to 80 percent, immediate post-burn

2. Limit overstory ponderosa pine mortality to 5 percent within 5 years post-burn
3. Generate 5 to 35 percent mortality in pole-sized trees within 5 years post-fire
4. Increase diversity, percent cover, and/or density of native grass and native forb species by at least 15 percent within 5 years post-burn; reduce the percent cover of any non-native plant species by at least 15 percent within 5 years post-burn

Mixed Conifer Stands with Ponderosa Pine Component:

1. Reduce total fuel load, including all woody material, litter, and duff, by 40 to 80 percent, immediate post-burn
2. Generate sufficient crown scorch, foliage consumption, or cambium heating to reduce overstory density 10 to 25 percent and/or produce mortality in 10 to 25 percent of overstory trees within 5 years post-burn
3. Generate sufficient crown scorch, foliage consumption, or cambium heating to reduce pole-sized tree density 10 to 25 percent and/or produce mortality in 10 to 25 percent of pole-sized trees within 5 years post-burn
4. Increase aspen (*Populus tremuloides*) seedling/sucker density by at least 20 percent within 5 years post-burn

Manual Treatment Objectives

Zone I:

1. Establish canopy spacing ranging 3 to 20 feet between overstory trees and sized-trees, immediate post-treatment. All stumps would be flush-cut at ground level.
2. Limb all overstory trees up to 5 feet above ground level. Limbs should be removed as close to the trunk as possible without damaging the tree.
3. Eliminate (greater than 90 percent) all dead-and-down material greater than two inches diameter.

4. Fall and remove all undesirable snags, following consultation with resources management specialists.

Zone II:

1. Establish a canopy opening ranging from 1 to 10 feet between overstory and pole-sized trees.
2. Limb 30 percent to 80 percent of all overstory trees up to 5 feet above ground level. Limbs should be removed as close to the trunk as possible without damaging the tree.
3. Reduce (50 percent) dead-and-down greater than 2 inches diameter.

Florissant Fossil Beds National Monument

